

# TV-1120M <sup>2487</sup>



B&W TV

## SPECIFICATIONS

**Picture tube:** 11" 90° deflection

**Semiconductors:** 31 transistors, 22 diodes, 1 thermistor, 1 IC and 1 high voltage selenium rectifier

**Channel coverage:** VHF; French F2, F4-F12  
CCIR Western European, Belgian E2-E12  
Italian B (E4), D (E5)  
H (E10), H1 (E-11)  
UHF; 21 ~ 69

**Antenna system:** VHF; Built-in telescopic antenna  
Terminals for 300  $\Omega$  external antenna  
UHF; Loop antenna  
Terminals for 300  $\Omega$  external antenna

**IF circuit:** 3 stages with 4 stagger tuned elements

**Intermediate frequency:**

|                         |         |     |     | Video IF           | Sound IF             |
|-------------------------|---------|-----|-----|--------------------|----------------------|
| Intercarrier system     | CCIR    | VHF | 625 | 38.9 MHz           | 33.4 MHz             |
|                         |         | UHF | 625 | 38.9 MHz, 34.9 MHz | 27.75 MHz, 46.05 MHz |
| Separate-carrier system | French  | VHF | 625 | 38.9 MHz           | 32.4 MHz             |
|                         | French  | UHF | 819 | 38.9 MHz           | 32.4 MHz             |
|                         | Belgian | VHF | 625 | 38.9 MHz           | 33.4 MHz             |

**Sound system:** Power output; 800 mV (less than 10 % distortion)  
Speaker; 80 mm x 120 mm (3 1/8" x 4 3/4"), impedance; 16  $\Omega$

**Automatic controls:** TU VIF mean value forward AGC  
AM SIF mean value AGC  
Single pulse AFC

**Power requirements:** AC 110 V, 130 V, 220 V 50 Hz  
DC 12 V

**Power consumption:** AC 37 W (maximum)  
DC 21 W (maximum)

**Dimensions:** 302 mm (W) x 314 mm (H) x 301 mm (D)  
(11 7/8" x 12 3/8" x 11 5/8")

**Weight:** 7.4 kg (16 lb 5 oz)

**Accessories:** Earphone (ME-20B)  
Loop antenna (AN-8)  
Instruction manual  
Polishing cloth

**Optional accessories:** Battery pack BP-7 (Sony)  
Battery #564 (Eveready)  
TOB-1235 SY (Sonnenschein)  
Car battery cord DCC-11.5  
External antenna connector EAC-10  
Car antenna VCA-1, -1H, -2

# SONY®

## SERVICE MANUAL

2487

## SECTION 1 OUTLINE

### 1-1. BLOCK DIAGRAM

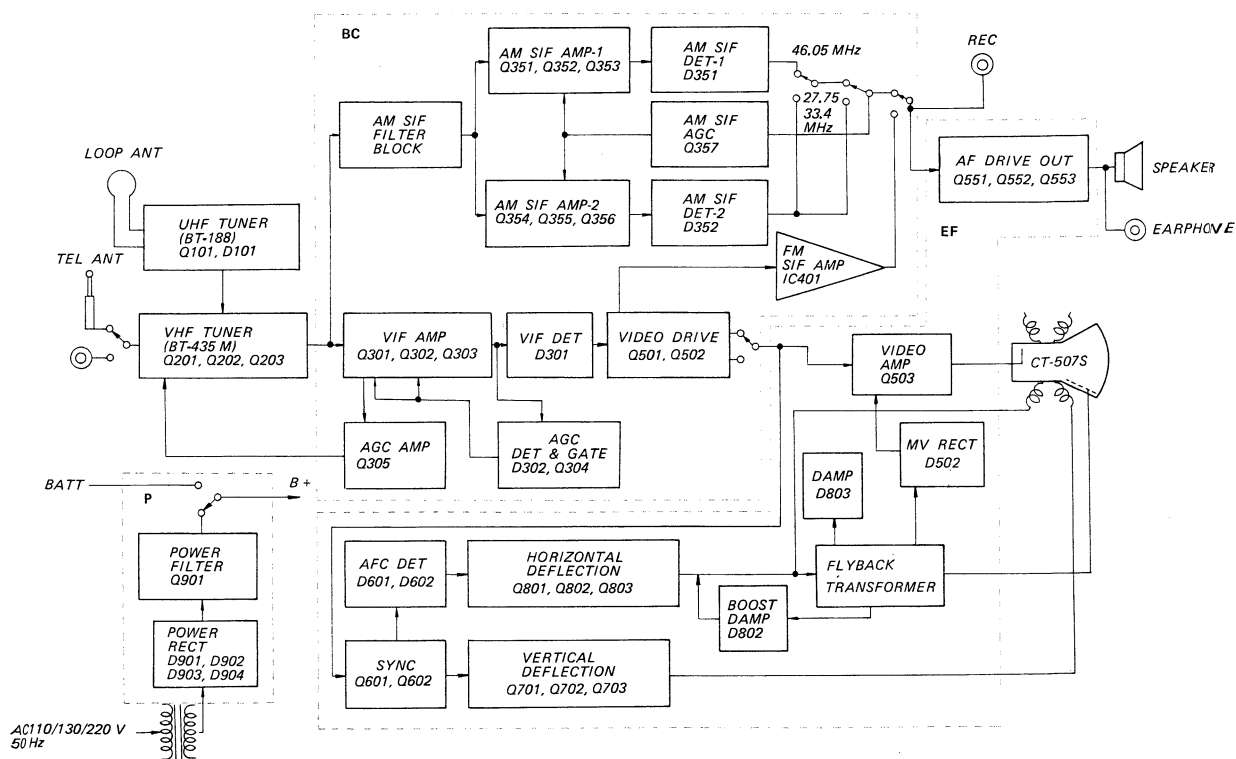


Fig. 1-1

## 1-2. EXTERNAL VIEW

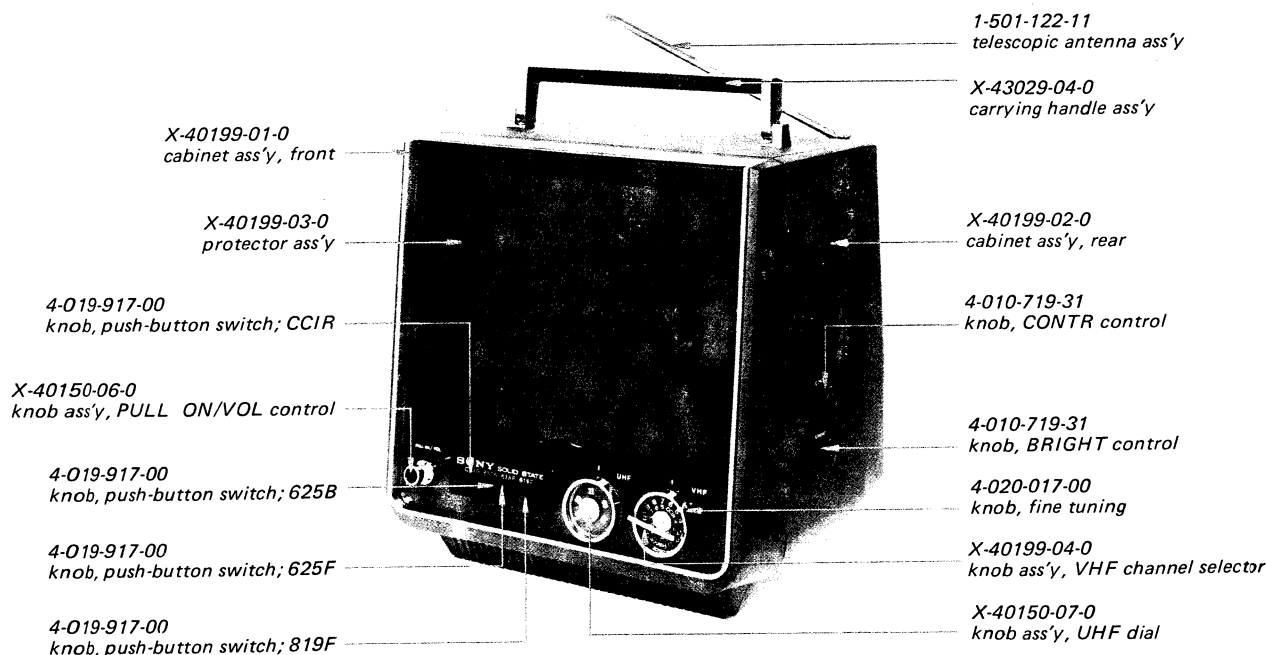


Fig. 1-2.

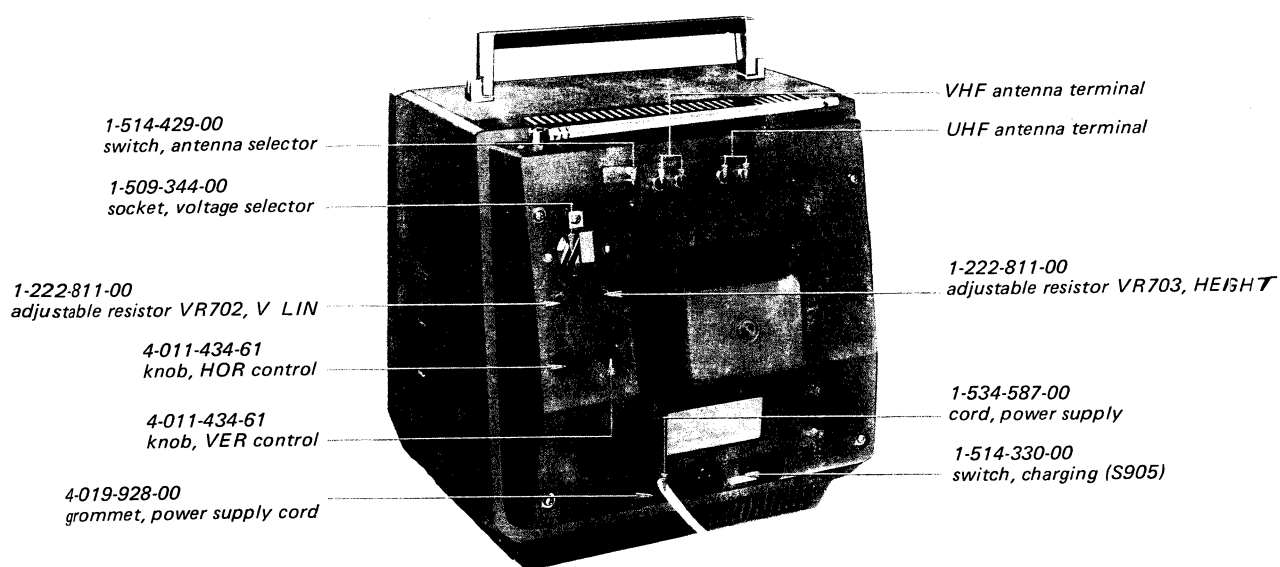


Fig. 1-3.

### 1-3. INTERNAL VIEW

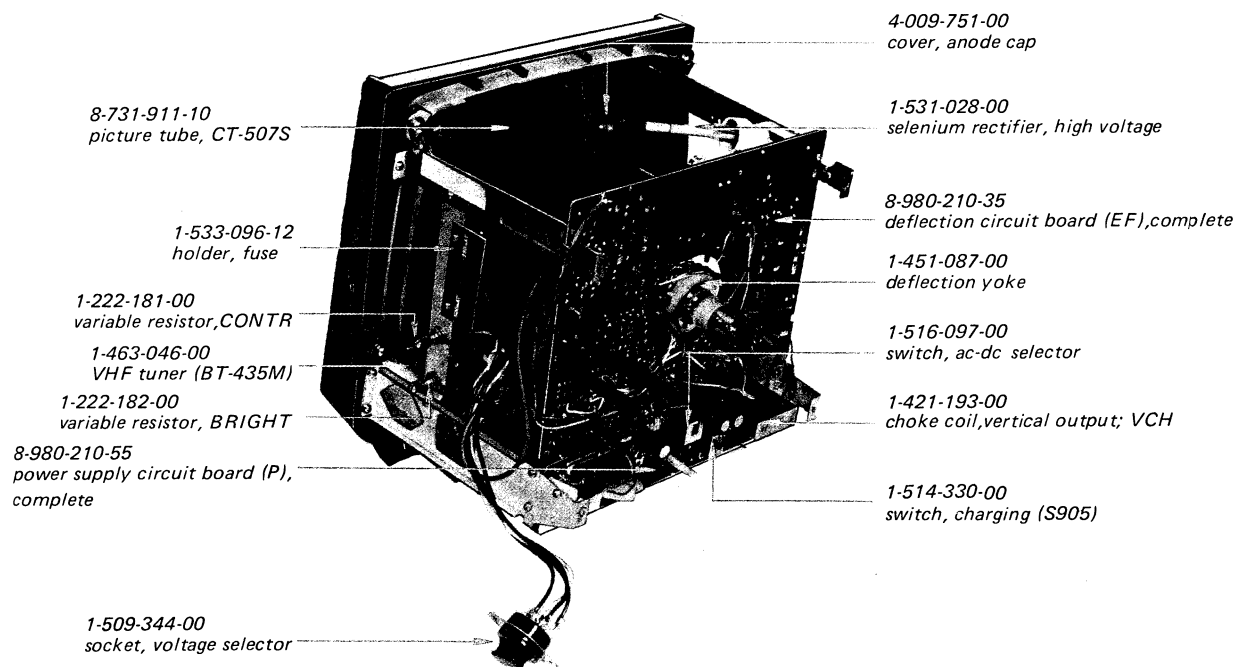


Fig. 1-4.

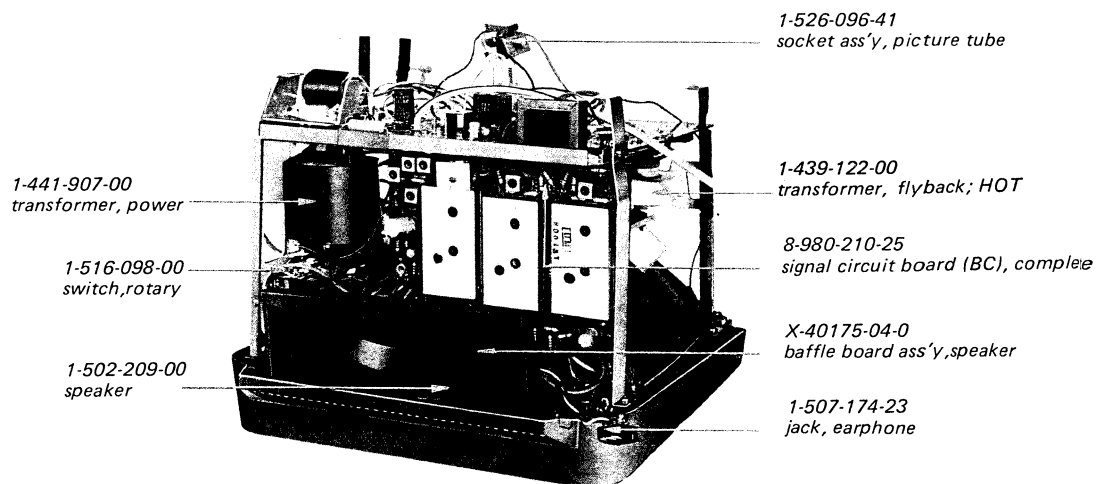


Fig. 1-5.

## SECTION 2

### DISASSEMBLY

#### 2-1. REAR CABINET REMOVAL

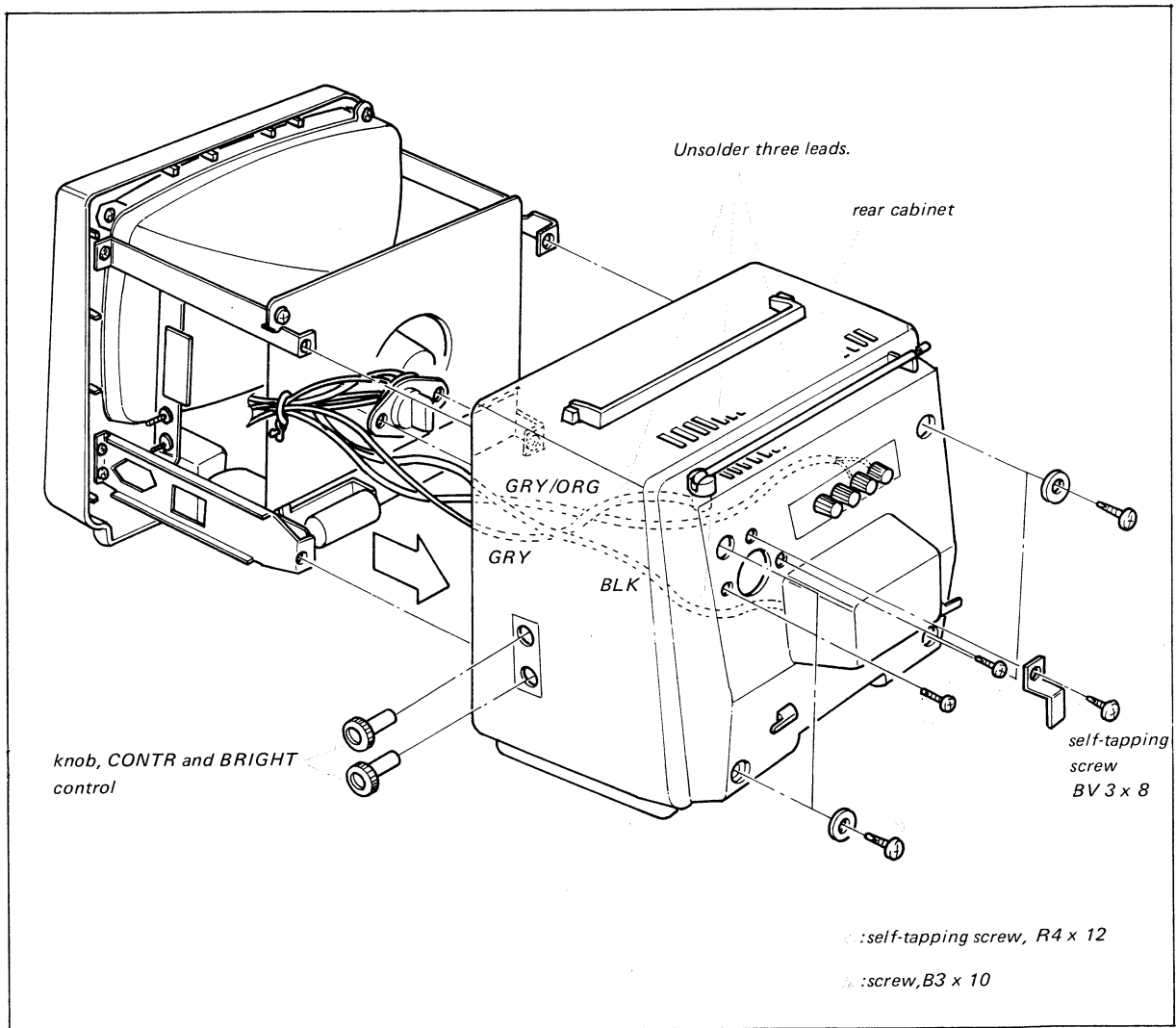


Fig. 2-1.

All screws in this set are phillips type (cross recess type).

## 2-2. P AND EF BOARD REMOVAL

1. Remove the rear cabinet.
2. Remove the P and EF boards in numerical order.

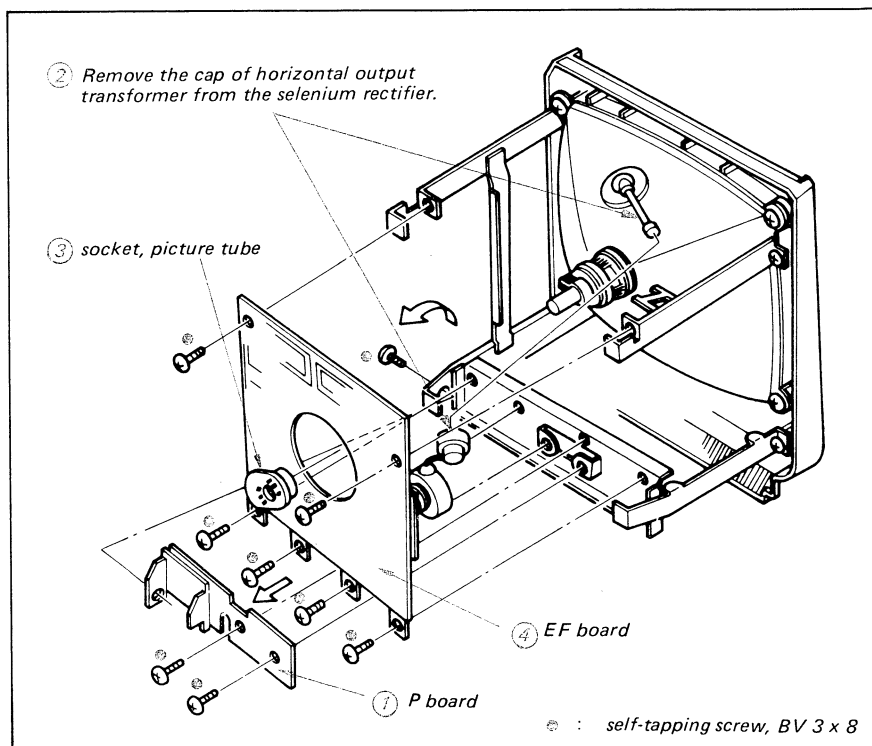


Fig. 2-2.

## 2-3. BC BOARD REMOVAL

Remove the rear cabinet.

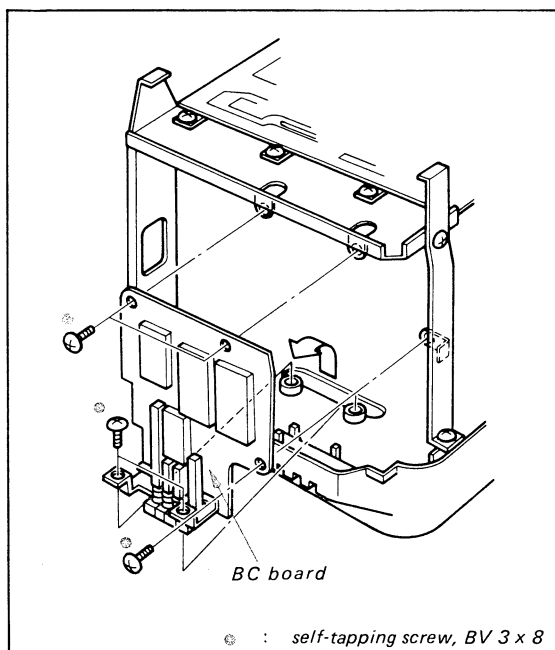


Fig. 2-3.

## 2-4. PROTECTOR REMOVAL

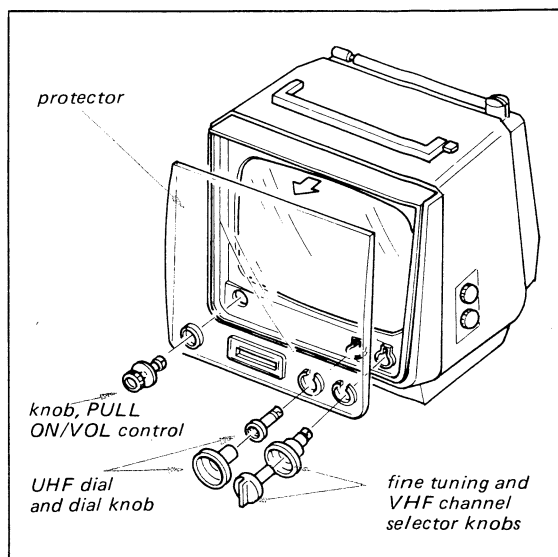


Fig. 2-4.

## 2-5. TUNER REMOVAL

1. Remove the rear cabinet.
2. Remove the tuners in numerical order;  
 ① ~ ④ for VHF tuner removal,  
 ⑤ ~ ⑧ for UHF tuner removal.
3. To remove the two screws securing the tuner brackets, use a long screwdriver as shown.

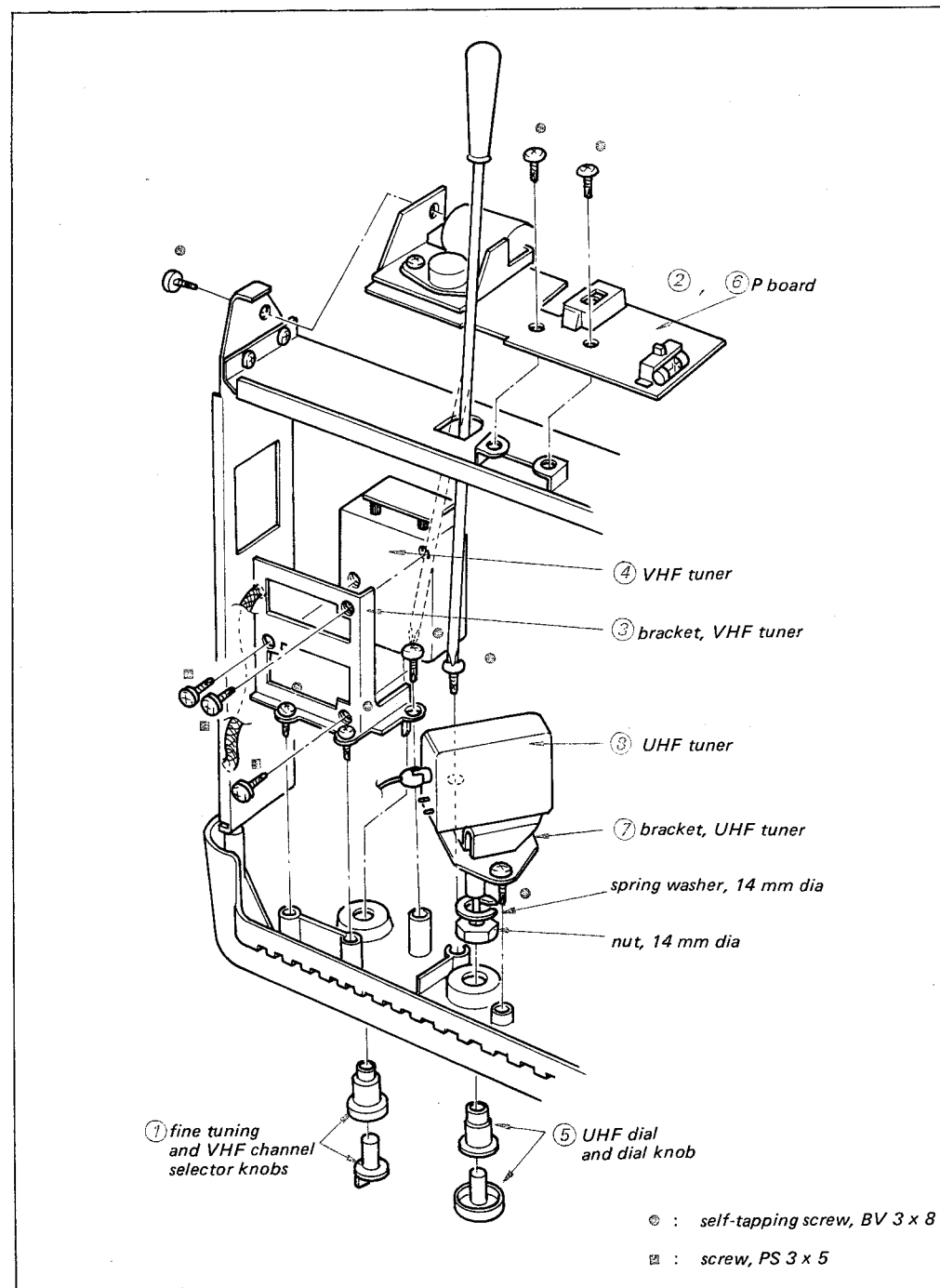


Fig. 2-5.

## 2-6. PICTURE TUBE REMOVAL

1. Remove the rear cabinet.
2. Remove the picture tube in numerical order.

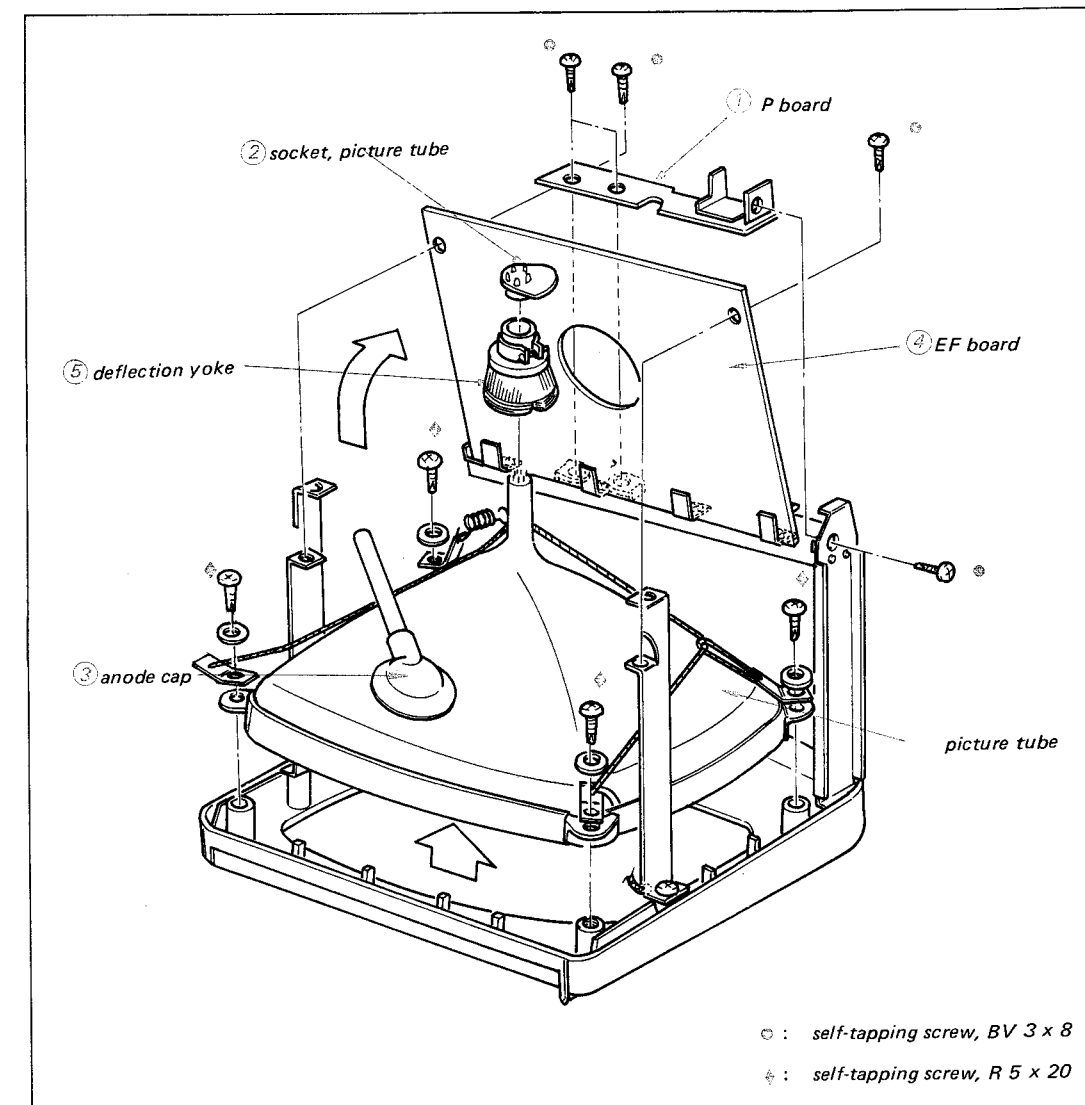


Fig. 2-6.

### CAUTION

In this model a new type picture tube is employed. Any former type picture tube can not be replaced. Use only CT-507S type picture tube (Part No. 8-731-911-10).

SECTION 3  
CIRCUIT ADJUSTMENTS

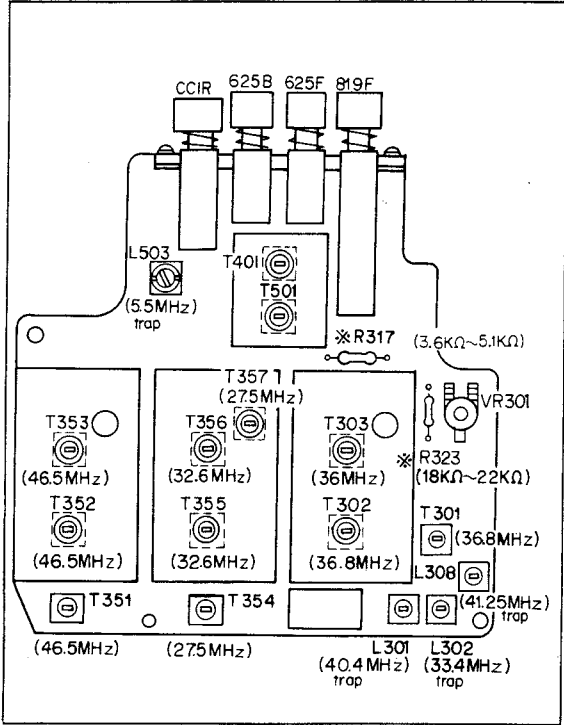


Fig. 3-1. Adjusting parts location of VIF and SIF adjustment

3-1. VIF ADJUSTMENT

Emitter Current  $I_e$  Adjustment of Q301

See Fig. 3-2.

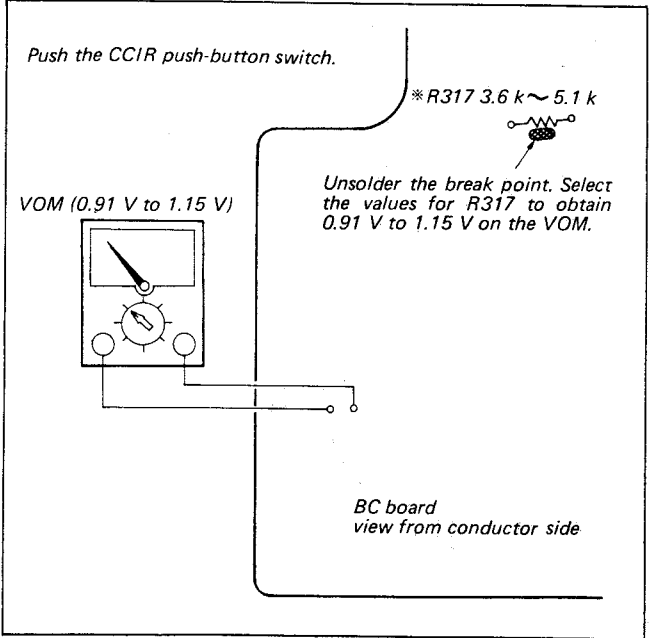


Fig. 3-2.

Equipment Required

Sweep generator  
Signal generator  
Marker generator  
Oscilloscope  
VOM  
Rheostat (250 kΩ)

Preparation

1. Make sure that the normal power voltage is obtained.
2. Set the channel selector to the highest inactive channel in the area.

33.4 MHz, 40.4 MHz and 41.25 MHz Trap Coil Adjustment

1. See Fig. 3-3.
2. Push the CCIR push-button switch.
3. Supply each strong signal of 33.4 MHz, 40.4 MHz and 41.25 MHz, with 1 kHz 40 % a-m modulation from the signal generator.
4. Turn the 250 kΩ rheostat to obtain the optimum waveform for adjustment.
5. Adjust L301, L302 and L308 for minimum output waveform.

VIF Response Curve Adjustment

1. See Fig. 3-3.
2. Push the CCIR push-button switch.
3. Turn the 250 kΩ rheostat to obtain 2.25 V on the VOM.
4. Supply each signal of 36 MHz, 36.8 MHz and 38 MHz, with 1 kHz 40 % a-m modulation from the signal generator.
5. Adjust T301, T302 and T303, and L207 for maximum output waveform on the scope.
6. If the sweep generator is available, make sure that the optimum response curve is obtained on the scope as shown.

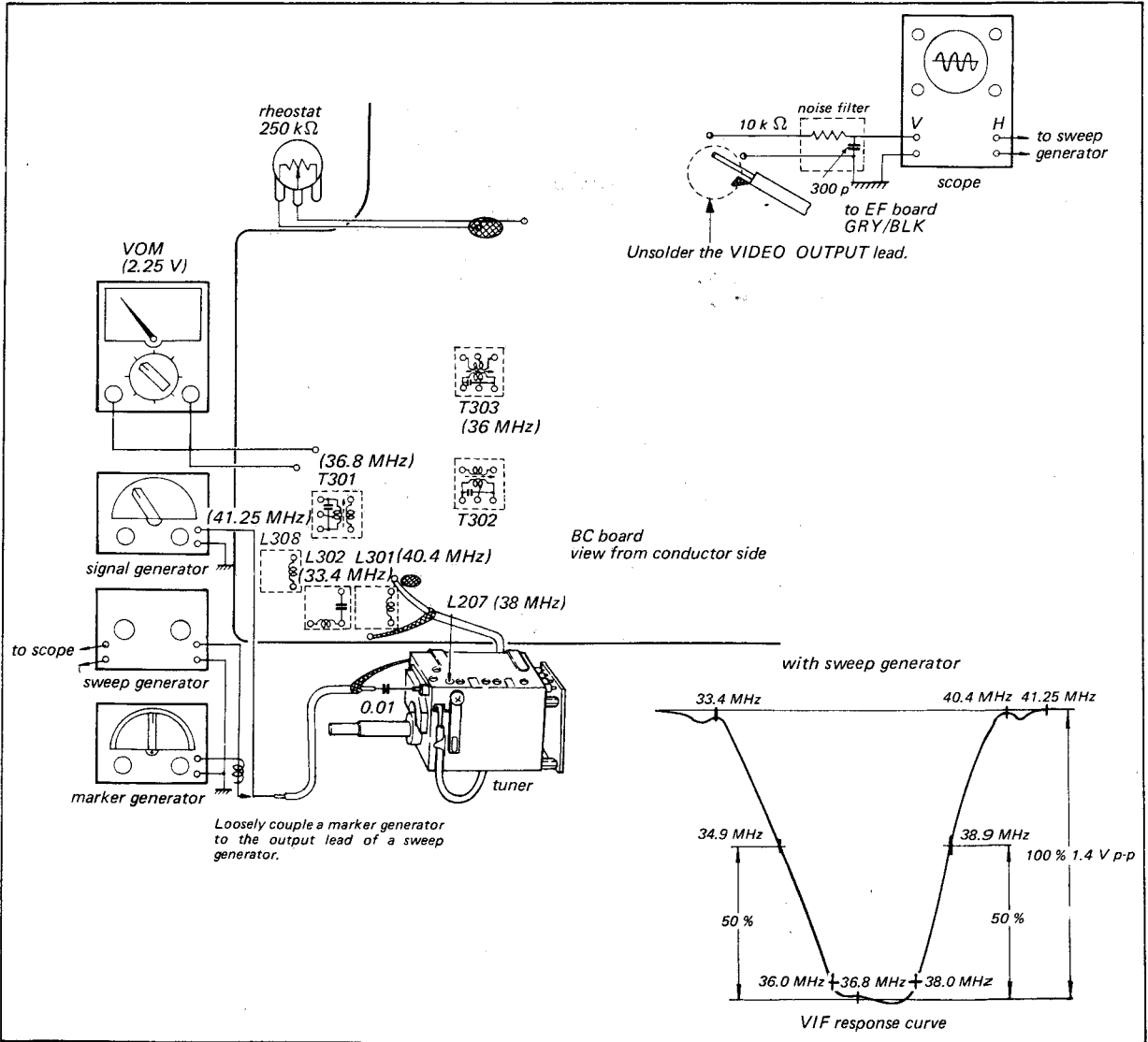


Fig. 3-3.



### Tuner AGC Adjustment

1. See Fig. 3-4.
2. Push the CCIR push-button switch.
3. Select the values for R323 to obtain 1.25 V to 1.35 V on the VOM.

### AGC Delay Adjustment

1. See Fig. 3-4.
2. Push the CCIR push-button switch.
3. Measure the voltage on the VOM with no signal. It should be 1.25 V to 1.35 V.
4. Supply the same frequency signal (with 1 kHz, 40 % a-m modulation) as the channel signal of the TV set.
5. Adjust the VR301 to obtain 0.2 V higher than the voltage measured at step 3.

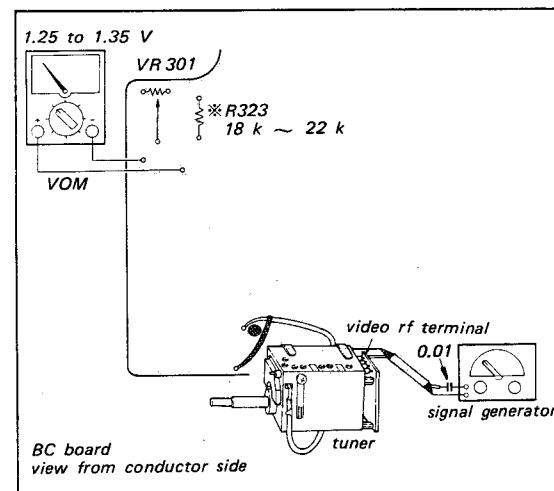


Fig. 3-4.

### 3-2. SIF ADJUSTMENT

#### FM SIF Adjustment

1. See Fig. 3-5.
2. Push the CCIR push-button switch.
3. Set the signal generator to 5.5 MHz with 1 kHz 30 % a-m modulation (50 dB).
4. Turn the core of T401 counterclockwise two or three times.
5. Adjust T501 for maximum output waveform.
6. Adjust T401 for minimum output waveform.
7. If the sweep generator is available, make sure that the optimum response curve is obtained.
8. Make sure that the buzz sound is not heard from the speaker.

#### 5.5 MHz Trap Coil Adjustment

1. See Fig. 3-5 and 3-6.
2. Push the CCIR push-button switch.
3. Supply the strong 5.5 MHz signal with 400 Hz 40 % a-m modulation from the signal generator.
4. Adjust L503 to eliminate the stripe from the picture.

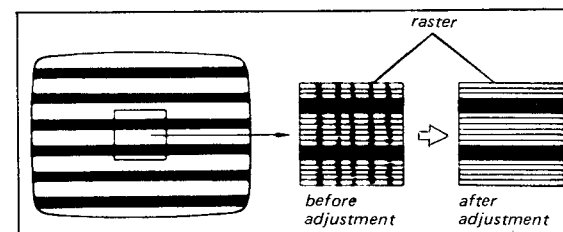


Fig. 3-6.

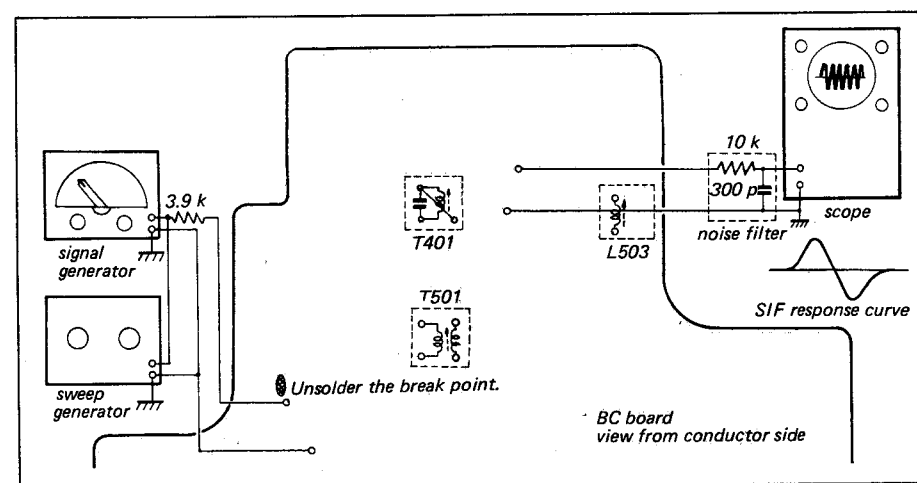


Fig. 3-5.

### AM SIF-1 Adjustment

1. See Fig. 3-7.
2. Push the 819F push-button.
3. Supply the 46.5 MHz signal with 1 kHz 40 % a-m modulation from the signal generator.
4. Adjust T351, T352 and T353 for maximum output on the scope.

**Note:** The height of the modulated waveform changes, when adjusting transformers. Readjust the output level of the signal generator to obtain 0.1 V (p-p) waveform constantly.

5. If a sweep generator is available, make sure that the optimum response curve is obtained.

### AM SIF-2 Adjustment

1. See Fig. 3-7.
2. Push the 625B push-button.
3. Supply the 27.5 MHz signal with 1 kHz 40 % a-m modulation from the signal generator.
4. Adjust T354 and T357 for maximum output on the scope.
5. Change the frequency of signal generator to 32.6 MHz.
6. Adjust T355 and T356 for maximum output on the scope.
7. If a sweep generator is available, make sure that the optimum response curve is obtained.

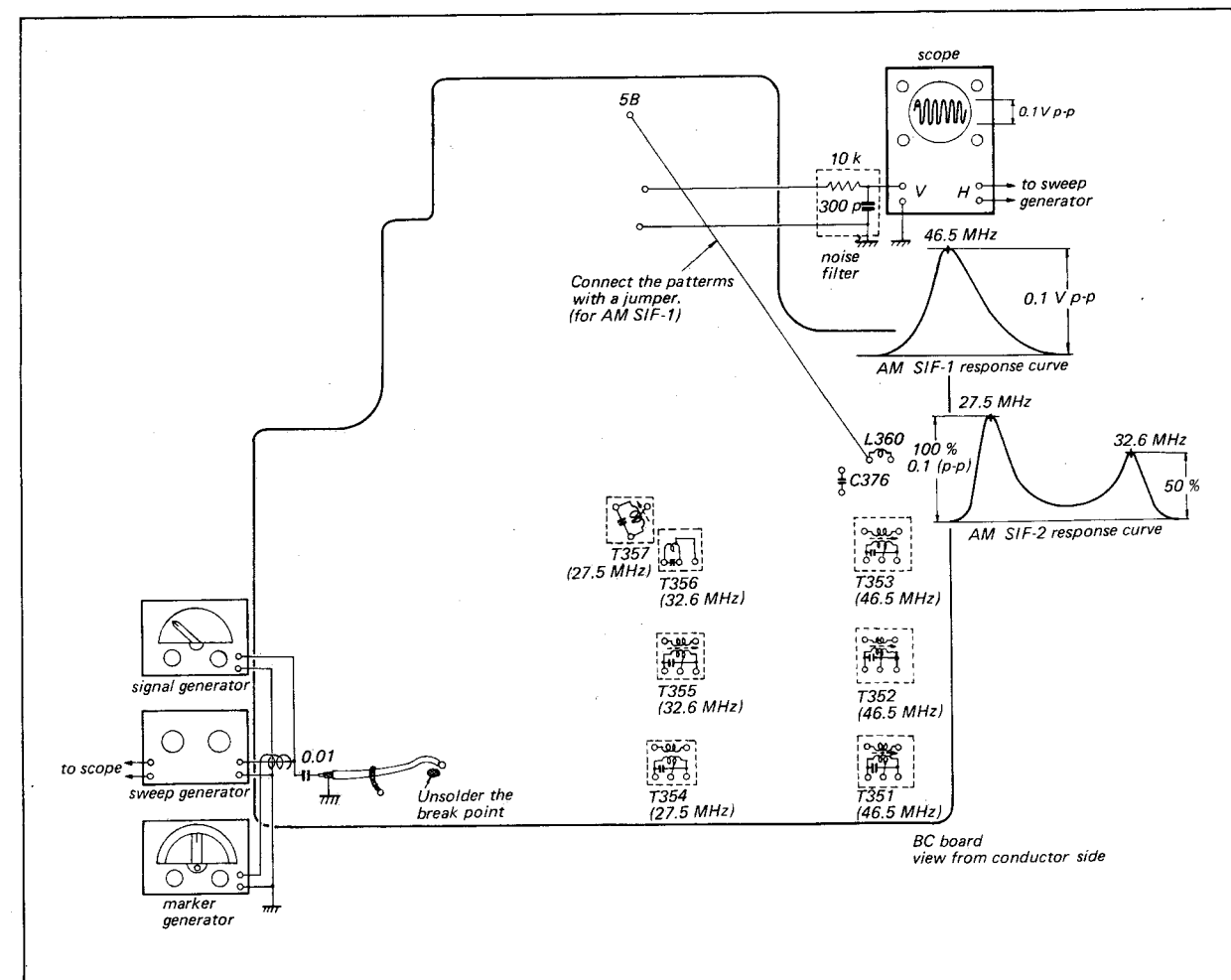


Fig. 3-7.

### 3-3. DEFLECTION CIRCUIT ADJUSTMENT

#### Preparation

1. Make sure that the normal power voltage is obtained.
2. Receive an off-the-air signal.
3. Push the 819F push-button.
4. Set the CONTR and BRT controls to the position where optimum picture can be obtained.
5. After making adjustment for 819 lines, perform the same steps by pushing the 625B push-button.

#### Horizontal Pulse-width Adjustment

See Fig. 3-8 and 3-9.

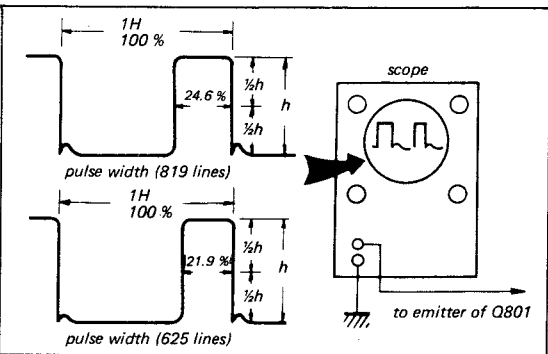


Fig. 3-8.

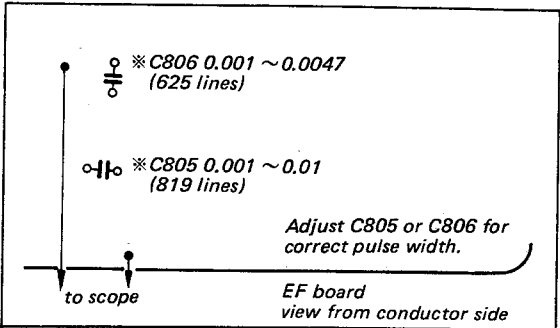


Fig. 3-9.

Note: C806 should be adjusted after C805 is adjusted.

#### Horizontal Frequency Adjustment

See Fig. 3-10 and 3-11.

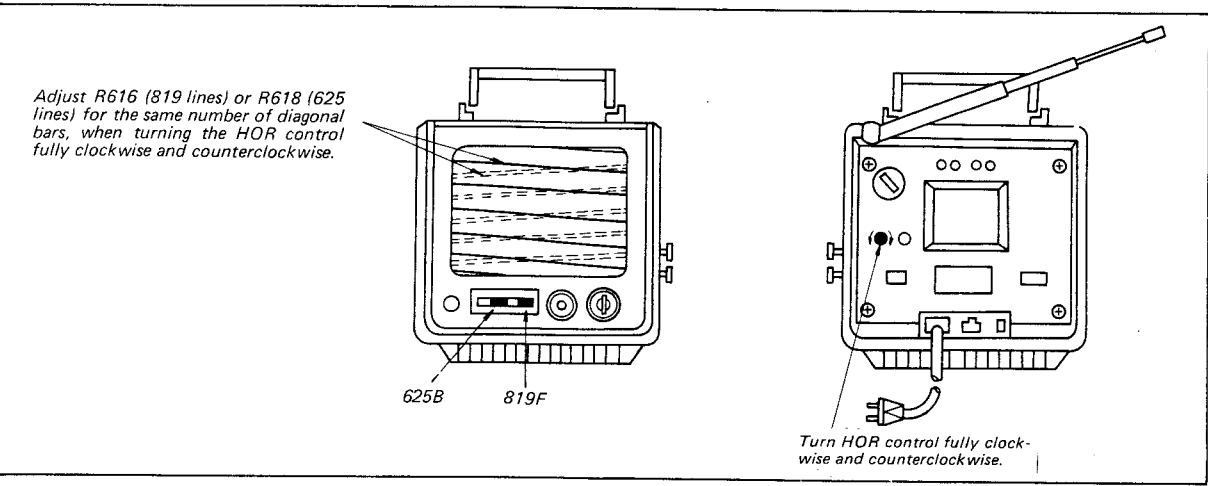


Fig. 3-10.

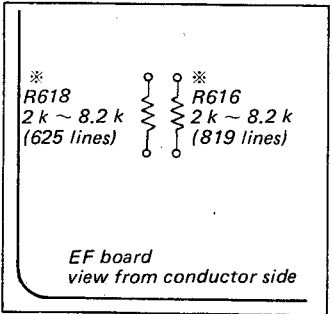


Fig 3-11.

#### Horizontal Size Adjustment

See Fig. 3-12 and 3-13.

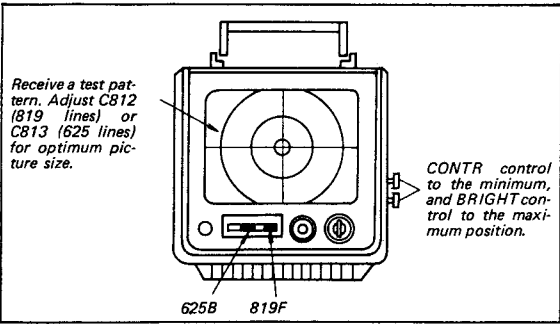


Fig. 3-12.

Note: C813 should be adjusted after C812 is adjusted.

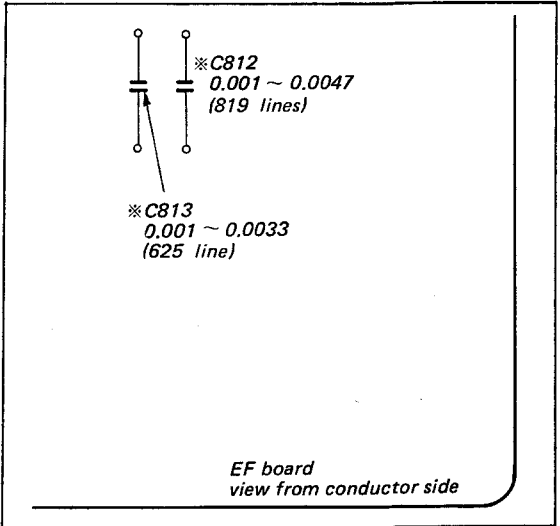


Fig. 3-13.

#### Vertical Bias Adjustment

See Fig. 3-14.

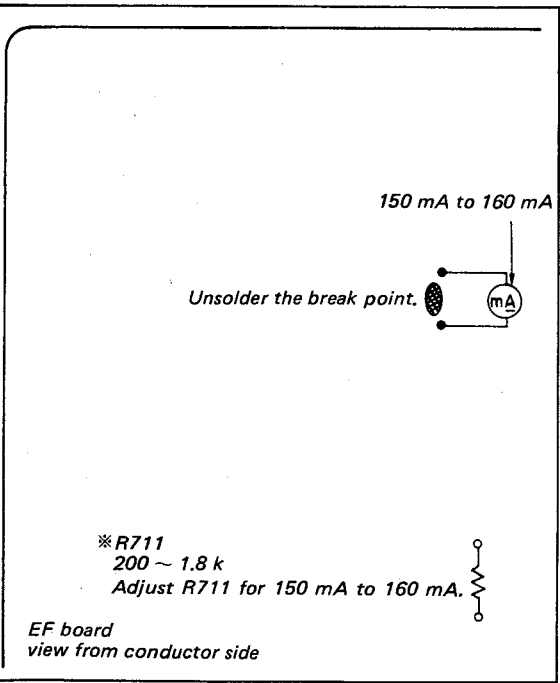


Fig. 3-14.

After making adjustment, check the current for the same value by pushing the 625B push-button.

#### Vertical Height and Linearity Adjustment

See Fig. 3-15.

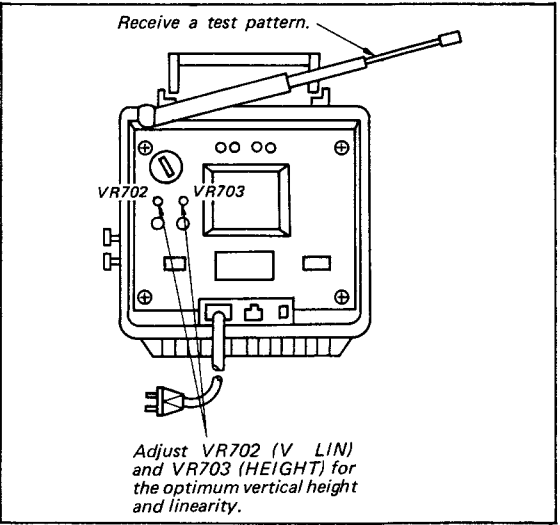
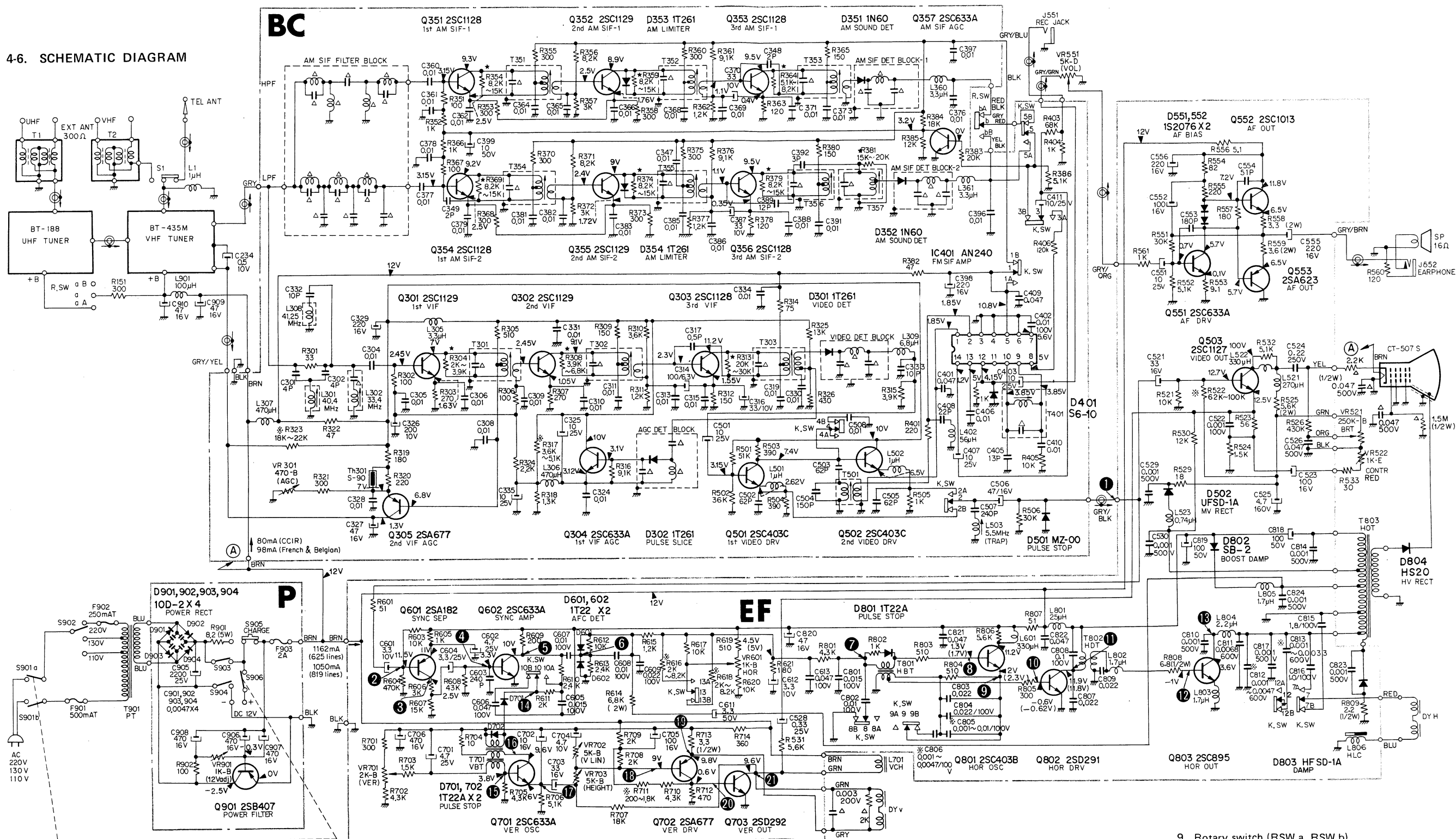


Fig. 3-15.

After making adjustment, check for the same vertical height and linearity by pushing the 625B push-button.

**TV-112UM TV-112UM**

#### 4-6. SCHEMATIC DIAGRAM



**Note:** 1. All capacitors are 50 WV unless otherwise specified.

2. All capacitance values are in  $\mu\text{F}$  except as indicated with p, which means  $\mu\mu\text{F}$ .

3. All resistors are  $\frac{1}{4}$  W unless otherwise specified.

4. All resistance values are in ohms.  $k = 1000$ .

5. Voltages measured from chassis to point indicated with a VOM (DC 20 k ohms/V) with no signal input (BC circuit and audio stages in EF circuit), and with signal input (EF circuit). The values shown in ( ) are measured with push switch set to 819.

6. Resistance and capacitance values marked ※ are to be selected to yield specified operating conditions.

7. The red circled numbers ( ❶ ~ ❷ ) indicate the waveforms on pages 19 and 20.

8. Push-button switch (KSW 1 to KSW 13)

A ; on (push) position

B ; off position

KSW 1 ~ 4 ; CCIR

KSW 5 ; 625B

KSW 7 ~ 13 ; 819F

9 Rotary switch (RSW a, RSW b)

RSW a    aA   ;   UHF  
          aB   ;   VHF

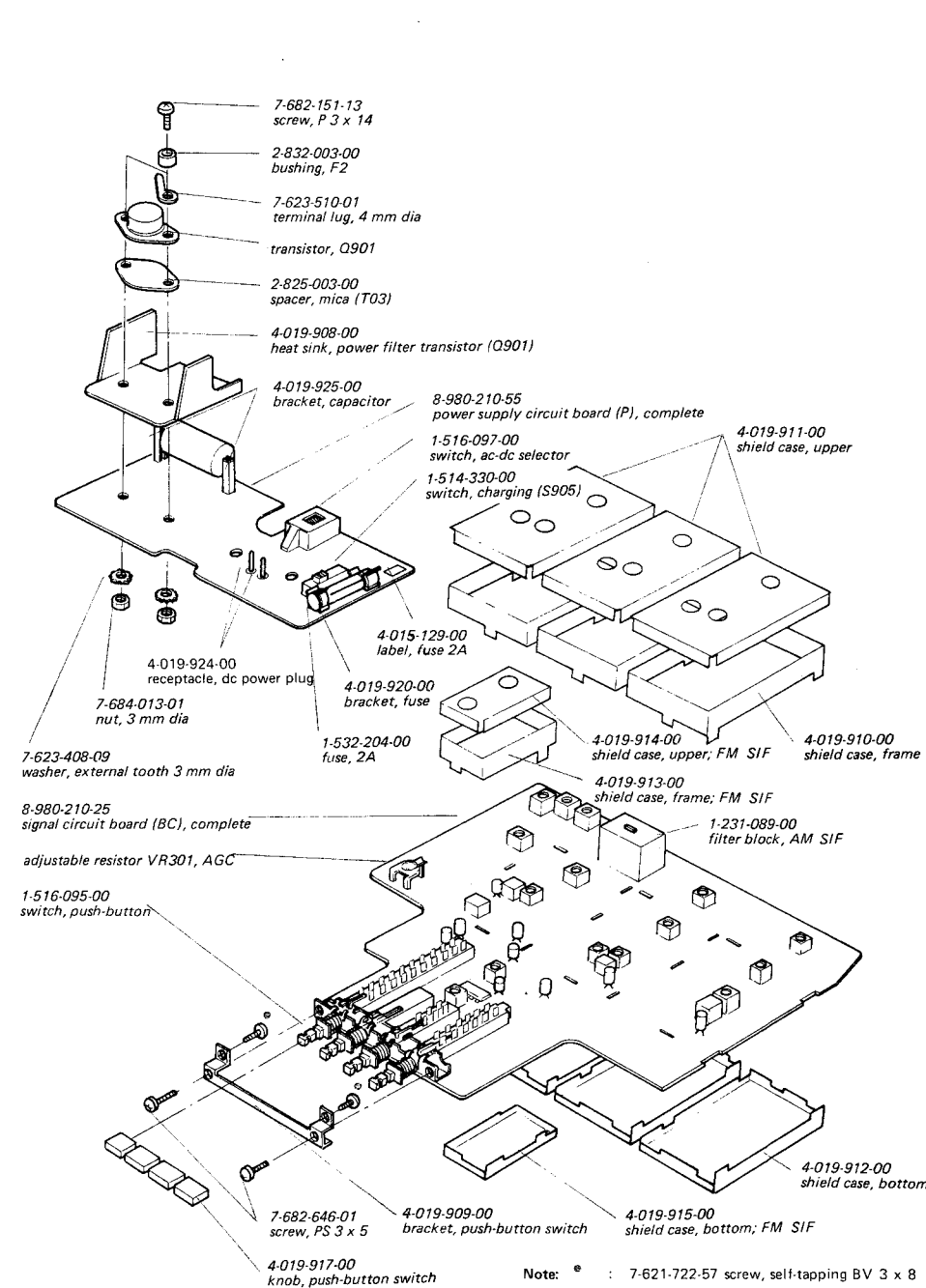
RSW b    bA ;    F2, 4, 5, 8, 10, 12 ch.  
             bB ;    F6, 7, 9, 11, U ch.

10. As for the resistors marked ★, replace the same value when it is necessary.

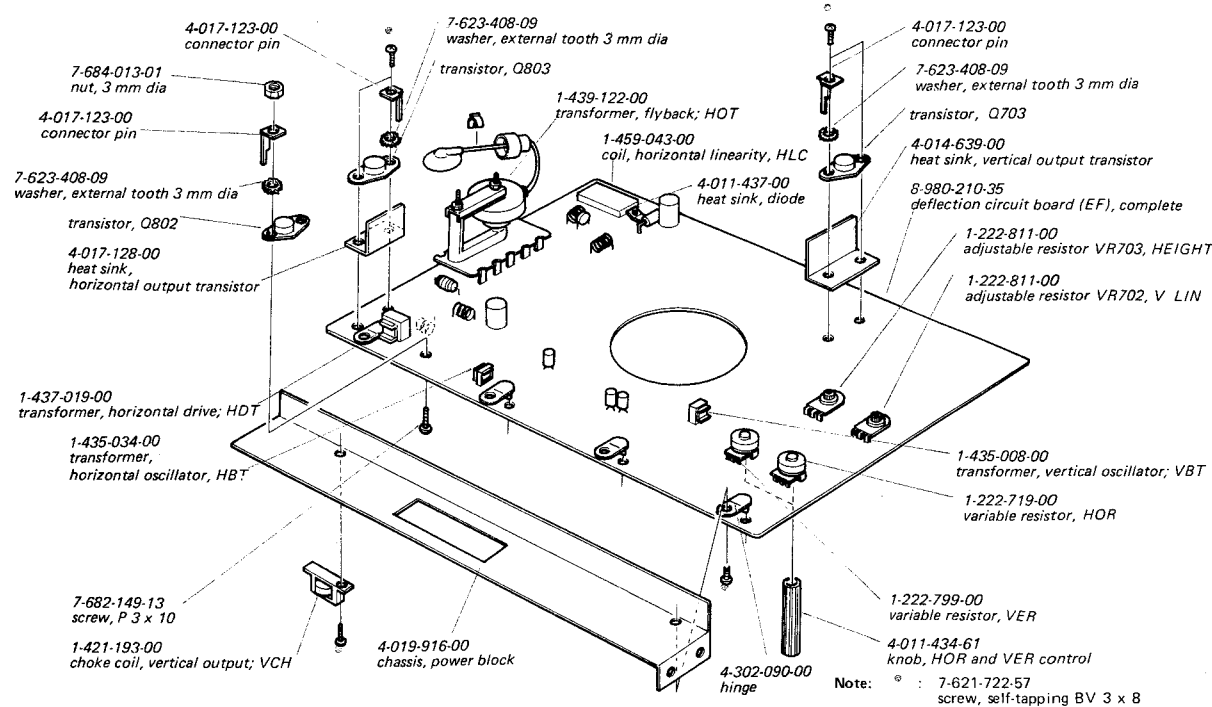
11.  $\Delta$  mark shows the internal components.



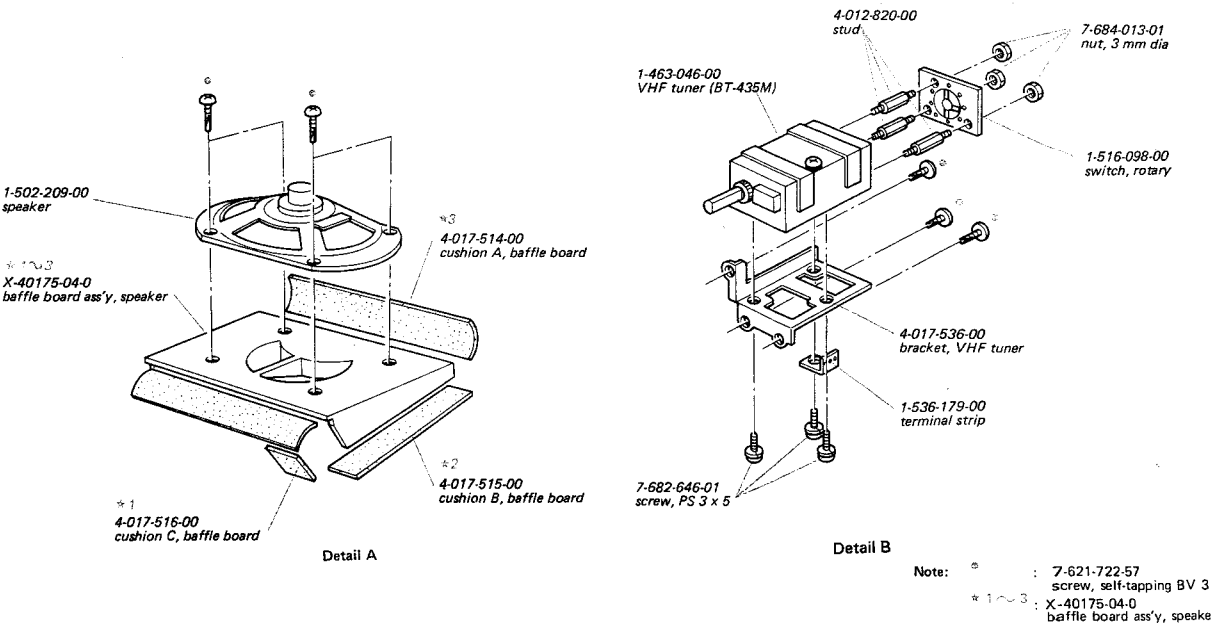
5-2. EXPLODED VIEW (2)



5-3. EXPLODED VIEW (3)



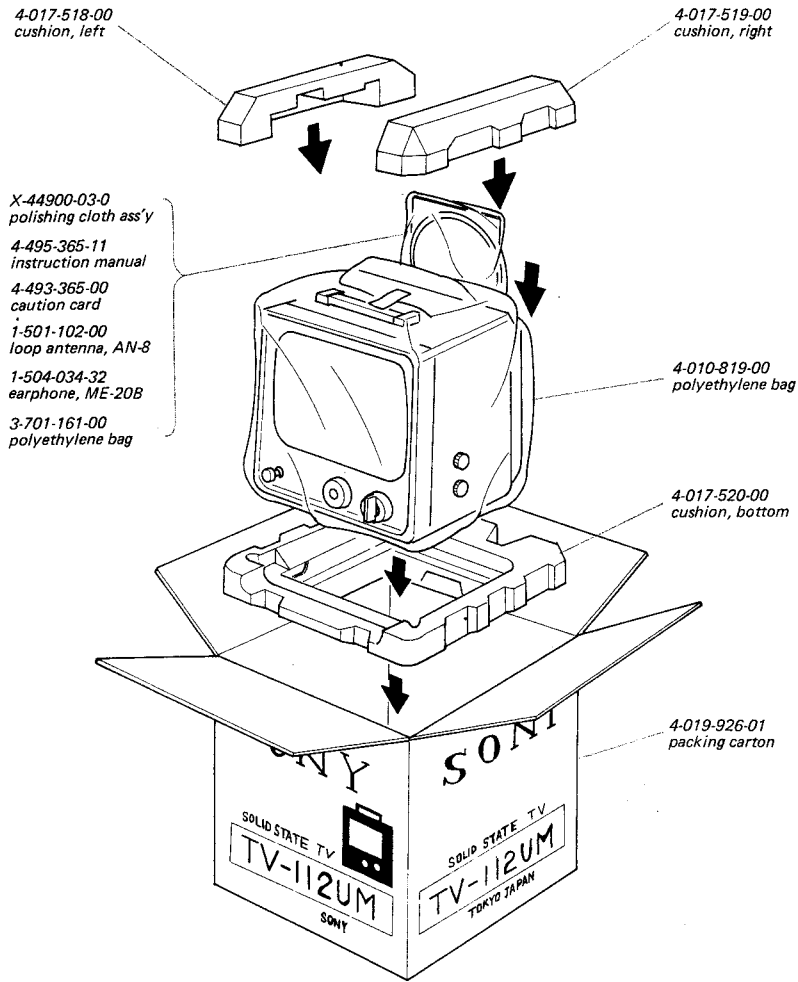
5-4. EXPLODED VIEW (4)



SECTION 6

ELECTRICAL PARTS LIST

5-5. PACKING



Hardware Nomenclature

|   |  |  |  |
|---|--|--|--|
| <b>P</b> — Pan Head Screw                     |  | <b>SC</b> — Set Screw  |  |
| <b>PS</b> — Pan Head Screw with Spring Washer |  | <b>E</b> — Retaining Ring (E Washer)   |  |
| <b>K</b> — Flat Countersunk Head Screw        |  | <b>W</b> — Washer  |  |
| <b>B</b> — Binding Head Screw                 |  | <b>SW</b> — Spring Washer  |  |
| <b>RK</b> — Oval Countersunk Head Screw       |  | <b>LW</b> — Lock Washer  |  |
| <b>T</b> — Truss Head Screw                   |  | <b>N</b> — Nut   |  |
| <b>R</b> — Round Head Screw                   |  | <div>— Example —</div> <div> <div>Type of Slot</div> <div> <div>P 3×10</div> <div>Length in mm (L)</div> <div>Diameter in mm (D)</div> <div>Type of Head</div> </div> <div></div> </div> |  |
| <b>F</b> — Flat Fillister Head Screw          |  |  |  |

| Ref. No.     | Part No. | Description                              |
|--------------|----------|--|
| GENERAL      |          |  |
| 1-463-046-00 |          | VHF tuner (BT-435 M)                     |
| 1-463-108-00 |          | UHF tuner (BT-188)                       |
| 8-980-210-25 |          | signal circuit board (BC), complete      |
| 8-980-210-35 |          | deflection circuit board (EF), complete  |
| 8-980-210-55 |          | power supply circuit board (P), complete |

|      |            | SEMICONDUCTORS                           |                      |
|------|------------|--|----------------------|
|      |            | To Replace                               | Substitute This Type |
| Q301 | transistor | 2SC1129                                  |                      |
| Q302 | transistor | 2SC1129                                  |                      |
| Q303 | transistor | 2SC1128                                  |                      |
| Q304 | transistor | 2SC633A                                  | 2SC634A              |
| Q305 | transistor | 2SA677                                   | 2SA678               |
| Q351 | transistor | 2SC1128                                  |                      |
| Q352 | transistor | 2SC1129                                  |                      |
| Q353 | transistor | 2SC1128                                  |                      |
| Q354 | transistor | 2SC1128                                  |                      |
| Q355 | transistor | 2SC1129                                  |                      |
| Q356 | transistor | 2SC1128                                  |                      |
| Q357 | transistor | 2SC633A                                  | 2SC634A              |
| Q501 | transistor | 2SC403C                                  |                      |
| Q502 | transistor | 2SC403C                                  |                      |
| Q503 | transistor | 2SC1127                                  |                      |
| Q551 | transistor | 2SC633A                                  | 2SC634A              |
| Q552 | transistor | 2SC1013                                  | 2SC1014              |
| Q553 | transistor | 2SA623                                   |                      |
| Q601 | transistor | 2SA182                                   |                      |
| Q602 | transistor | 2SC633A                                  | 2SC634A              |
| Q701 | transistor | 2SC633A                                  | 2SC634A              |
| Q702 | transistor | 2SA677                                   | 2SA678               |
| Q703 | transistor | 2SD292                                   |                      |
| Q801 | transistor | 2SC403B                                  |                      |
| Q802 | transistor | 2SD291                                   | 2SD292               |
| Q803 | transistor | 2SC895                                   |                      |
| Q901 | transistor | 2SB407                                   |                      |
| D301 | diode      | 1T261 ; included in video detector block |                      |
| D302 | diode      | 1T261 ; included in AGC detector block   |                      |
| D351 | diode      | 1N60 ; included in AM SIF detector block |                      |
| D352 | diode      | 1N60 ; included in AM SIF detector block |                      |
| D353 | diode      | 1T261                                    |                      |
| D354 | diode      | 1T261                                    |                      |
| D401 | diode      | S6-10                                    |                      |
| D501 | diode      | MZ-00                                    | 2SC403C              |
| D502 | diode      | UFSD-1A                                  | HFSD-1A              |

| Ref. No. | Part No.     | Description   | To Replace | Substitute This Type |
|----------|--------------|---|------------|----------------------|
| D551     |              | diode   | 1S2076     | 1S1555               |
| D552     |              | diode   | 1S2076     | 1S1555               |
| D601     |              | diode   | 1T22       | 1T22A                |
| D602     |              | diode   | 1T22       | 1T22A                |
| D701     |              | diode   | 1T22A      |                      |
| D702     |              | diode   | 1T22A      |                      |
| D801     |              | diode   | 1T22A      |                      |
| D802     |              | diode   | SB-2       |                      |
| D803     |              | diode   | HFSD-1A    |                      |
| D901     |              | diode   | 10D-2      | 10D-6                |
| D902     |              | diode   | 10D-2      | 10D-6                |
| D903     |              | diode   | 10D-2      | 10D-6                |
| D904     |              | diode   | 10D-2      | 10D-6                |
|          | 1-403-351-00 | AGC detector block; including D302                        |            |                      |
|          | 1-403-353-00 | video detector block; including D301                      |            |                      |
|          | 1-403-366-00 | AM SIF detector block; including diode, 1N60 (D351, D352) |            |                      |
| IC401    | 8-759-424-00 | IC, AN-240  |            |                      |
| TH301    | 8-690-003-00 | thermistor, S-90  |            |                      |
| COILS    |              |   |            |                      |
| L1       | 1-407-178-00 | 1 $\mu$ H, micro inductor                                 |            |                      |
| L301     | 1-409-153-00 | coil, wave trap; 40.4 MHz                                 |            |                      |
| L302     | 1-409-150-00 | coil, wave trap; 33.4 MHz                                 |            |                      |
| L303     |              | -----   |            |                      |
| L304     |              | -----   |            |                      |
| L305     | 1-407-184-00 | 3.3 $\mu$ H, micro inductor                               |            |                      |
| L306     | 1-407-177-00 | 470 $\mu$ H, micro inductor                               |            |                      |
| L307     | 1-407-177-00 | 470 $\mu$ H, micro inductor                               |            |                      |
| L308     | 1-409-153-00 | coil, wave trap; 41.25 MHz                                |            |                      |
| L309     | 1-407-188-00 | 6.8 $\mu$ H, micro inductor                               |            |                      |
| L360     | 1-407-184-00 | 3.3 $\mu$ H, micro inductor                               |            |                      |
| L361     | 1-407-184-00 | 3.3 $\mu$ H, micro inductor                               |            |                      |
| L401     |              | -----   |            |                      |
| L402     | 1-407-166-00 | 56 $\mu$ H, micro inductor                                |            |                      |
| L501     | 1-407-178-00 | 1 $\mu$ H, micro inductor                                 |            |                      |
| L502     | 1-407-178-00 | 1 $\mu$ H, micro inductor                                 |            |                      |
| L503     | 1-409-036-00 | coil, wave trap; 5.5 MHz                                  |            |                      |
| L521     | 1-407-174-00 | 270 $\mu$ H, micro inductor                               |            |                      |
| L522     | 1-407-175-00 | 330 $\mu$ H, micro inductor                               |            |                      |
| L523     | 1-407-365-00 | 0.74 $\mu$ H, RF choke coil                               |            |                      |
| L601     | 1-407-175-00 | 330 $\mu$ H, micro inductor                               |            |                      |
| L701     | 1-421-193-00 | choke coil, vertical output; VCH                          |            |                      |
| L801     | 1-421-013-00 | 25 $\mu$ H, micro inductor                                |            |                      |
| L802     | 1-407-366-00 | 1.7 $\mu$ H, RF choke coil                                |            |                      |
| L803     | 1-407-366-00 | 1.7 $\mu$ H, RF choke coil                                |            |                      |
| L804     | 1-407-220-00 | 2.2 $\mu$ H, RF choke coil                                |            |                      |
| L805     | 1-407-366-00 | 1.7 $\mu$ H, RF choke coil                                |            |                      |
| L806     | 1-459-043-00 | coil, horizontal linearity, HLC                           |            |                      |

Ref. No.    Part No.    Description

L901    1-407-169-00    100  $\mu$ H, micro inductor

### TRANSFORMERS

|      |              |   |
|------|--------------|---|
| T1   | 1-417-014-21 | transformer, antenna matching; UHF      |
| T2   | 1-417-014-51 | transformer, antenna matching; VHF      |
| T301 | 1-403-508-00 | transformer, video i-f                  |
| T302 | 1-403-508-00 | transformer, video i-f                  |
| T303 | 1-403-510-00 | transformer, video i-f                  |
| T351 | 1-403-534-00 | transformer, AM sound i-f               |
| T352 | 1-403-534-00 | transformer, AM sound i-f               |
| T353 | 1-403-535-00 | transformer, AM sound i-f               |
| T354 | 1-403-536-00 | transformer, AM sound i-f               |
| T355 | 1-403-536-00 | transformer, AM sound i-f               |
| T356 | 1-403-537-00 | transformer, AM sound i-f               |
| T357 | 1-403-538-00 | transformer, AM sound i-f               |
| T401 | 1-403-843-00 | transformer, FM sound i-f discriminator |
| T501 | 1-403-354-00 | transformer, FM sound i-f               |
| T701 | 1-435-008-00 | transformer, vertical oscillator; VBT   |
| T801 | 1-435-034-00 | transformer, horizontal oscillator; HBT |
| T802 | 1-437-019-00 | transformer, horizontal drive; HDT      |
| T803 | 1-439-122-00 | transformer, flyback; HOT               |
| T901 | 1-441-907-00 | transformer, power                      |

### CAPACITORS

Capacitors are in  $\mu$ F except as indicated with p,  $\pm \frac{100}{0}\%$ , 50 WV and ceramic unless otherwise specified. P means  $\mu$ F.

|      |              |       |                        |        |                             |
|------|--------------|-------|------------------------|--------|-----------------------------|
| C234 | 1-127-022-11 | 0.5   | $\pm 20\%$             | 10 WV  | solid aluminum electrolytic |
| C301 | 1-102-937-11 | 4 p   | $\pm 0.25$ p           |        |                             |
| C302 | 1-102-937-11 | 4 p   | $\pm 0.25$ p           |        |                             |
| C303 |              | ----- |                        |        |                             |
| C304 | 1-101-004-11 | 0.01  |                        |        |                             |
| C305 | 1-101-004-11 | 0.01  |                        |        |                             |
| C306 | 1-101-004-11 | 0.01  |                        |        |                             |
| C307 |              | ----- |                        |        |                             |
| C308 | 1-101-004-11 | 0.01  |                        |        |                             |
| C309 | 1-101-004-11 | 0.01  |                        |        |                             |
| C310 | 1-101-004-11 | 0.01  |                        |        |                             |
| C311 | 1-101-004-11 | 0.01  |                        |        |                             |
| C312 |              | ----- |                        |        |                             |
| C313 | 1-101-004-11 | 0.01  |                        |        |                             |
| C314 | 1-121-413-11 | 100   | $\pm \frac{100}{10}\%$ | 6.3 WV | electrolytic                |
| C315 | 1-101-004-11 | 0.01  |                        |        |                             |
| C316 | 1-121-402-11 | 33    | $\pm \frac{100}{10}\%$ | 10 WV  | electrolytic                |
| C317 | 1-101-837-11 | 0.5 p | $\pm 0.25$ p           |        |                             |
| C318 |              | ----- |                        |        |                             |
| C319 | 1-101-004-11 | 0.01  |                        |        |                             |
| C320 |              | ----- |                        |        |                             |
| C321 |              | ----- |                        |        |                             |

Ref. No.    Part No.    Description

|      |              |       |                        |       |              |
|------|--------------|-------|------------------------|-------|--------------|
| C322 |              | ----- |                        |       |              |
| C323 |              | ----- |                        |       |              |
| C324 | 1-101-004-11 | 0.01  |                        |       |              |
| C325 | 1-121-398-11 | 10    | $\pm \frac{100}{10}\%$ | 25 WV | electrolytic |
| C326 | 1-121-712-11 | 200   | $\pm 20\%$             | 10 WV | electrolytic |
| C327 | 1-121-409-11 | 47    | $\pm \frac{100}{10}\%$ | 16 WV | electrolytic |
| C328 | 1-101-004-11 | 0.01  |                        |       |              |
| C329 | 1-121-421-11 | 220   | $\pm \frac{100}{10}\%$ | 16 WV | electrolytic |
| C330 | 1-101-004-11 | 0.01  |                        |       |              |
| C331 | 1-101-004-11 | 0.01  |                        |       |              |
| C332 | 1-102-947-11 | 10 P  | $\pm 5\%$              |       |              |
| C333 | 1-102-947-11 | 10 P  | $\pm 5\%$              |       |              |
| C334 | 1-101-004-11 | 0.01  |                        |       |              |
| C335 | 1-121-398-11 | 10    | $\pm \frac{100}{10}\%$ | 25 WV | electrolytic |
| C347 | 1-101-004-11 | 0.01  |                        |       |              |
| C348 | 1-102-935-11 | 2 p   | $\pm 0.25$ p           |       |              |
| C349 | 1-102-935-11 | 2 p   | $\pm 0.25$ p           |       |              |
| C360 | 1-101-004-11 | 0.01  |                        |       |              |
| C361 | 1-101-004-11 | 0.01  |                        |       |              |
| C362 | 1-101-004-11 | 0.01  |                        |       |              |
| C363 |              | ----- |                        |       |              |
| C364 | 1-101-004-11 | 0.01  |                        |       |              |
| C365 | 1-101-004-11 | 0.01  |                        |       |              |
| C366 | 1-101-004-11 | 0.01  |                        |       |              |
| C367 |              | ----- |                        |       |              |
| C368 | 1-101-004-11 | 0.01  |                        |       |              |
| C369 | 1-101-004-11 | 0.01  |                        |       |              |
| C370 | 1-121-402-11 | 33    | $\pm \frac{100}{10}\%$ | 10 WV | electrolytic |
| C371 | 1-101-004-11 | 0.01  |                        |       |              |
| C372 |              | ----- |                        |       |              |
| C373 | 1-101-004-11 | 0.01  |                        |       |              |
| C374 |              | ----- |                        |       |              |
| C375 |              | ----- |                        |       |              |
| C376 | 1-101-004-11 | 0.01  |                        |       |              |
| C377 | 1-101-004-11 | 0.01  |                        |       |              |
| C378 | 1-101-004-11 | 0.01  |                        |       |              |
| C379 | 1-101-004-11 | 0.01  |                        |       |              |
| C380 |              | ----- |                        |       |              |
| C381 | 1-101-004-11 | 0.01  |                        |       |              |
| C382 | 1-101-004-11 | 0.01  |                        |       |              |
| C383 | 1-101-004-11 | 0.01  |                        |       |              |
| C384 |              | ----- |                        |       |              |
| C385 | 1-101-004-11 | 0.01  |                        |       |              |
| C386 | 1-101-004-11 | 0.01  |                        |       |              |
| C387 | 1-121-402-11 | 33    | $\pm \frac{100}{10}\%$ | 10 WV | electrolytic |
| C388 | 1-101-004-11 | 0.01  |                        |       |              |
| C389 | 1-102-949-11 | 12 p  | $\pm 5\%$              |       |              |
| C390 |              | ----- |                        |       |              |
| C391 | 1-101-004-11 | 0.01  |                        |       |              |
| C392 | 1-102-936-11 | 3 p   | $\pm 0.25$ p           |       |              |
| C393 |              | ----- |                        |       |              |
| C394 |              | ----- |                        |       |              |
| C395 |              | ----- |                        |       |              |



| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u>                                 |
|-----------------|-----------------|--|
| C396            | 1-101-004-11    | 0.01   |
| C397            | 1-101-004-11    | 0.01   |
| C398            | 1-121-421-11    | 220 $\pm \frac{100}{10} \%$ 16 WV electrolytic     |
| C399            | 1-121-716-11    | 10 $\pm 20 \%$ 50 WV electrolytic                  |
| C401            | 1-101-006-11    | 0.047  |
| C402            | 1-105-713-12    | 0.01 $\pm 10 \%$ 100 WV mylar                      |
| C403            | 1-121-398-11    | 10 $\pm \frac{100}{10} \%$ 25 WV electrolytic      |
| C404            |                 | -----  |
| C405            | 1-102-667-11    | 13 p $\pm 5 \%$                                    |
| C406            | 1-101-004-11    | 0.01   |
| C407            | 1-121-398-11    | 10 $\pm \frac{100}{10} \%$ 25 WV electrolytic      |
| C408            | 1-102-959-11    | 22 p $\pm 5 \%$                                    |
| C409            | 1-101-006-11    | 0.047  |
| C410            | 1-101-004-11    | 0.01   |
| C411            | 1-121-398-11    | 10 $\pm \frac{100}{10} \%$ 25 WV electrolytic      |
| C501            | 1-121-398-11    | 10 $\pm \frac{100}{10} \%$ 25 WV electrolytic      |
| C502            | 1-101-886-11    | 62 p $\pm 5 \%$                                    |
| C503            | 1-102-849-11    | 62 p $\pm 5 \%$                                    |
| C504            | 1-102-888-11    | 150 p $\pm 5 \%$                                   |
| C505            | 1-101-886-11    | 62 p $\pm 5 \%$                                    |
| C506            | 1-121-409-11    | 47 $\pm \frac{100}{10} \%$ 16 WV electrolytic      |
| C507            | 1-103-610-11    | 240 p 50 WV polystyrene                            |
| C508            | 1-101-004-11    | 0.01   |
| C521            | 1-121-403-11    | 33 $\pm \frac{100}{10} \%$ 16 WV electrolytic      |
| C522            | 1-105-701-12    | 0.001 $\pm 10 \%$ 100 WV mylar                     |
| C523            | 1-121-415-11    | 100 $\pm \frac{100}{10} \%$ 16 WV electrolytic     |
| C524            | 1-113-127-11    | 0.22 $\pm 20 \%$ 250 WV paper                      |
| C525            | 1-121-246-11    | 4.7 $\pm \frac{150}{10} \%$ 160 WV electrolytic    |
| C526            | 1-113-122-11    | 0.047 $\pm 20 \%$ 500 WV paper                     |
| C527            |                 | -----  |
| C528            | 1-127-092-11    | 0.33 $\pm 20 \%$ 25 WV solid aluminum electrolytic |
| C529            | 1-101-845-11    | 0.001 500 WV                                       |
| C530            | 1-101-845-11    | 0.001 500 WV                                       |
| C531            |                 | -----  |
| C551            | 1-121-398-11    | 10 $\pm \frac{100}{10} \%$ 25 WV electrolytic      |
| C552            | 1-121-415-11    | 100 $\pm \frac{100}{10} \%$ 16 WV electrolytic     |
| C553            | 1-102-982-11    | 180 p $\pm 10 \%$                                  |
| C554            | 1-101-882-11    | 51 p $\pm 5 \%$                                    |
| C555            | 1-121-421-11    | 220 $\pm \frac{100}{10} \%$ 16 WV electrolytic     |
| C556            | 1-121-421-11    | 220 $\pm \frac{100}{10} \%$ 16 WV electrolytic     |
| C601            | 1-127-025-11    | 3.3 $\pm 20 \%$ 10 WV solid aluminum electrolytic  |
| C602            | 1-121-395-11    | 4.7 $\pm \frac{150}{10} \%$ 25 WV electrolytic     |
| C603            | 1-102-979-11    | 240 p  |
| C604            | 1-121-392-11    | 3.3 $\pm \frac{150}{10} \%$ 25 WV electrolytic     |
| C605            | 1-105-715-12    | 0.015 $\pm 10 \%$ 100 WV mylar                     |
| C606            | 1-105-721-12    | 0.047 $\pm 10 \%$ 100 WV mylar                     |
| C607            | 1-105-713-12    | 0.01 $\pm 10 \%$ 100 WV mylar                      |
| C608            | 1-105-713-12    | 0.01 $\pm 10 \%$ 100 WV mylar                      |
| C609            | 1-105-717-12    | 0.022 $\pm 10 \%$ 100 WV mylar                     |
| C610            |                 | -----  |
| C611            | 1-121-393-11    | 3.3 $\pm \frac{150}{10} \%$ 50 WV electrolytic     |

| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u>                                |
|-----------------|-----------------|---|
| C612            | 1-127-025-11    | 3.3 $\pm 20 \%$ 10 WV solid aluminum electrolytic |
| C613            | 1-105-721-12    | 0.047 $\pm 10 \%$ 100 WV mylar                    |
| C701            | 1-127-232-11    | 4.7 $\pm 20 \%$ 25 WV solid aluminum electrolytic |
| C702            | 1-131-158-11    | 10 $\pm 20 \%$ 16 WV tantalum                     |
| C703            | 1-121-403-11    | 33 $\pm \frac{100}{10} \%$ 16 WV electrolytic     |
| C704            | 1-127-026-11    | 4.7 $\pm 20 \%$ 10 WV solid aluminum electrolytic |
| C705            | 1-121-415-11    | 100 $\pm \frac{100}{10} \%$ 16 WV electrolytic    |
| C706            | 1-121-426-11    | 470 $\pm \frac{100}{10} \%$ 16 WV electrolytic    |
| C801            | 1-105-715-12    | 0.015 $\pm 10 \%$ 100 WV mylar                    |
| C802            | 1-105-713-12    | 0.01 $\pm 10 \%$ 100 WV mylar                     |
| C803            | 1-129-776-11    | 0.022 $\pm 5 \%$ 50 WV polypropylene              |
| C804            | 1-105-717-12    | 0.022 $\pm 10 \%$ 100 WV mylar                    |
| C805            | 1-105-703-12    | 0.001 $\pm 10 \%$ 100 WV mylar                    |
|                 | 1-105-705-12    | 0.0022 $\pm 10 \%$ 100 WV mylar                   |
|                 | 1-105-707-12    | 0.0033 $\pm 10 \%$ 100 WV mylar                   |
|                 | 1-105-709-12    | 0.0047 $\pm 10 \%$ 100 WV mylar                   |
|                 | 1-105-711-12    | 0.0068 $\pm 10 \%$ 100 WV mylar                   |
| C806            | 1-105-713-12    | 0.01 $\pm 10 \%$ 100 WV mylar                     |
|                 | 1-105-703-12    | 0.001 $\pm 10 \%$ 100 WV mylar                    |
|                 | 1-105-705-12    | 0.0022 $\pm 10 \%$ 100 WV mylar                   |
|                 | 1-105-707-12    | 0.0033 $\pm 10 \%$ 100 WV mylar                   |
| C807            | 1-105-709-12    | 0.0047 $\pm 10 \%$ 100 WV mylar                   |
|                 | 1-101-005-11    | 0.022   |
|                 | 1-105-725-12    | 0.1 $\pm 10 \%$ 100 WV mylar                      |
| C808            | 1-105-725-12    | 0.1 $\pm 10 \%$ 100 WV mylar                      |
| C809            | 1-101-005-11    | 0.022   |
| C810            | 1-101-845-11    | 0.001 500 WV                                      |
| C811            | 1-105-466-16    | 0.0068 $\pm 10 \%$ 600 WV mylar                   |
| C812            | 1-105-461-16    | 0.001 $\pm 10 \%$ 600 WV mylar                    |
|                 | 1-105-462-16    | 0.0015 $\pm 10 \%$ 600 WV mylar                   |
|                 | 1-105-463-16    | 0.0022 $\pm 10 \%$ 600 WV mylar                   |
|                 | 1-105-464-16    | 0.0033 $\pm 10 \%$ 600 WV mylar                   |
|                 | 1-105-465-16    | 0.0047 $\pm 10 \%$ 600 WV mylar                   |
| C813            | 1-105-461-16    | 0.001 $\pm 10 \%$ 600 WV mylar                    |
|                 | 1-105-462-16    | 0.0015 $\pm 10 \%$ 600 WV mylar                   |
|                 | 1-105-463-16    | 0.0022 $\pm 10 \%$ 600 WV mylar                   |
|                 | 1-105-464-16    | 0.0033 $\pm 10 \%$ 600 WV mylar                   |
| C814            | 1-101-845-11    | 0.001 500 WV                                      |
| C815            | 1-129-496-11    | 1.8 $\pm 10 \%$ 100 WV metalized mylar            |
| C816            | 1-129-497-11    | 1 $\pm 10 \%$ 100 WV metalized mylar              |
| C817            | 1-101-845-11    | 0.001 500 WV                                      |
| C818            | 1-121-703-11    | 100 $\pm \frac{100}{10} \%$ 50 WV electrolytic    |
| C819            | 1-121-703-11    | 100 $\pm \frac{100}{10} \%$ 50 WV electrolytic    |
| C820            | 1-121-409-11    | 47 $\pm \frac{100}{10} \%$ 16 WV electrolytic     |
| C821            | 1-101-006-11    | 0.047   |
| C822            | 1-101-006-11    | 0.047   |
| C823            | 1-101-845-11    | 0.001 500 WV                                      |
| C824            | 1-101-845-11    | 0.001 500 WV                                      |
| C901            | 1-101-003-11    | 0.0047  |



| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u>                              |
|-----------------|-----------------|---|
| C902            | 1-101-003-11    | 0.0047  |
| C903            | 1-101-003-11    | 0.0047  |
| C904            | 1-101-003-11    | 0.0047  |
| C905            | 1-123-035-11    | 2200 $\pm \frac{100}{10} \%$ 25 WV electrolytic |
| C906            | 1-121-426-11    | 470 $\pm \frac{100}{10} \%$ 16 WV electrolytic  |
| C907            | 1-121-426-11    | 470 $\pm \frac{100}{10} \%$ 16 WV electrolytic  |
| C908            | 1-121-426-11    | 470 $\pm \frac{100}{10} \%$ 16 WV electrolytic  |
| C909            | 1-121-409-11    | 47 $\pm \frac{100}{10} \%$ 16 WV electrolytic   |
| C910            | 1-121-409-11    | 47 $\pm \frac{100}{10} \%$ 16 WV electrolytic   |

### RESISTORS

All resistors are in ohm, carbon,  $\pm 5 \%$  and 1/4 W unless otherwise specified. As for the resistors marked with  $\infty$ , replace the same value when it is necessary.

|      |              |       |                    |
|------|--------------|-------|--------------------|
| R151 | 1-244-660-11 | 300   |                    |
| R301 | 1-244-637-11 | 33    |                    |
| R302 | 1-244-649-11 | 100   |                    |
| R303 | 1-244-659-11 | 270   |                    |
| R304 | 1-202-003-11 | 2 k   | 1/8 W, composition |
|      | 1-201-821-11 | 3 k   | 1/8 W, composition |
|      | 1-202-018-11 | 3.9 k | 1/8 W, composition |
| R305 | 1-244-666-11 | 510   |                    |
| R306 | 1-244-649-11 | 100   |                    |
| R307 | 1-244-659-11 | 270   |                    |
| R308 | 1-202-018-11 | 3.9 k | 1/8 W, composition |
|      | 1-201-864-11 | 5.6 k | 1/8 W, composition |
|      | 1-202-032-11 | 6.8 k | 1/8 W, composition |
| R309 | 1-244-653-11 | 150   |                    |
| R310 | 1-244-686-11 | 3.6 k |                    |
| R311 | 1-244-675-11 | 1.2 k |                    |
| R312 | 1-244-653-11 | 150   |                    |
| R313 | 1-202-062-11 | 20 k  | 1/8 W, composition |
|      | 1-201-861-11 | 27 k  | 1/8 W, composition |
|      | 1-202-069-11 | 30 k  | 1/8 W, composition |
| R314 | 1-244-646-11 | 75    |                    |
| R315 | 1-244-687-11 | 3.9 k |                    |
| R316 | 1-244-696-11 | 9.1 k |                    |
| R317 | 1-244-686-11 | 3.6 k |                    |
|      | 1-244-687-11 | 3.9 k |                    |
|      | 1-244-688-11 | 4.3 k |                    |
|      | 1-244-689-11 | 4.7 k |                    |
|      | 1-244-690-11 | 5.1 k |                    |
| R318 | 1-244-676-11 | 1.3 k |                    |
| R319 | 1-244-655-11 | 180   |                    |
| R320 | 1-244-657-11 | 220   |                    |
| R321 | 1-244-660-11 | 300   |                    |
| R322 | 1-244-641-11 | 47    |                    |
| R323 | 1-244-703-11 | 18 k  |                    |
|      | 1-244-704-11 | 20 k  |                    |
|      | 1-244-705-11 | 22 k  |                    |
| R324 | 1-244-681-11 | 2.2 k |                    |
| R325 | 1-244-700-11 | 13 k  |                    |

| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u>       |
|-----------------|-----------------|--------------------------|
| R326            | 1-244-664-11    | 430                      |
| R351            | 1-244-649-11    | 100                      |
| R352            | 1-244-673-11    | 1 k                      |
| R353            | 1-244-660-11    | 300                      |
| R354            | 1-202-038-11    | 8.2 k 1/8 W, composition |
|                 | 1-201-865-11    | 10 k 1/8 W, composition  |
|                 | 1-201-866-11    | 15 k 1/8 W, composition  |
| R355            | 1-244-660-11    | 300                      |
| R356            | 1-244-695-11    | 8.2 k                    |
| R357            | 1-244-684-11    | 3 k                      |
| R358            | 1-244-660-11    | 300                      |
| R359            | 1-202-038-11    | 8.2 k 1/8 W, composition |
|                 | 1-201-865-11    | 10 k 1/8 W, composition  |
|                 | 1-201-866-11    | 15 k 1/8 W, composition  |
| R360            | 1-244-660-11    | 300                      |
| R361            | 1-244-696-11    | 9.1 k                    |
| R362            | 1-244-675-11    | 1.2 k                    |
| R363            | 1-244-651-11    | 120                      |
| R364            | 1-202-025-11    | 5.1 k 1/8 W, composition |
|                 | 1-202-032-11    | 6.8 k 1/8 W, composition |
|                 | 1-202-038-11    | 8.2 k 1/8 W, composition |
| R365            | 1-244-653-11    | 150                      |
| R366            | 1-244-673-11    | 1 k                      |
| R367            | 1-244-649-11    | 100                      |
| R368            | 1-244-660-11    | 300                      |
| R369            | 1-202-038-11    | 8.2 k 1/8 W, composition |
|                 | 1-201-865-11    | 10 k 1/8 W, composition  |
|                 | 1-201-866-11    | 15 k 1/8 W, composition  |
| R370            | 1-244-660-11    | 300                      |
| R371            | 1-244-695-11    | 8.2 k                    |
| R372            | 1-244-684-11    | 3 k                      |
| R373            | 1-244-660-11    | 300                      |
| R374            | 1-202-038-11    | 8.2 k 1/8 W, composition |
|                 | 1-201-865-11    | 10 k 1/8 W, composition  |
|                 | 1-201-866-11    | 15 k 1/8 W, composition  |
| R375            | 1-244-660-11    | 300                      |
| R376            | 1-244-696-11    | 9.1 k                    |
| R377            | 1-244-675-11    | 1.2 k                    |
| R378            | 1-244-651-11    | 120                      |
| R379            | 1-202-038-11    | 8.2 k 1/8 W, composition |
|                 | 1-201-865-11    | 10 k 1/8 W, composition  |
|                 | 1-201-866-11    | 15 k 1/8 W, composition  |
| R380            | 1-244-653-11    | 150                      |
| R381            | 1-201-866-11    | 15 k 1/8 W, composition  |
|                 | 1-202-062-11    | 20 k 1/8 W, composition  |
| R382            | 1-244-641-11    | 47                       |
| R383            | 1-244-704-11    | 20 k                     |
| R384            | 1-244-703-11    | 18 k                     |
| R385            | 1-244-699-11    | 12 k                     |
| R386            | 1-244-690-11    | 5.1 k                    |
| R401            | 1-244-657-11    | 220                      |
| R402            | 1-242-673-11    | 1 k                      |
| R403            | 1-244-717-11    | 68 k                     |

| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u>     |
|-----------------|-----------------|------------------------|
| R404            | 1-244-673-11    | 1 k                    |
| R405            | 1-242-697-11    | 10 k                   |
| R406            | 1-242-723-11    | 120 k                  |
| R501            | 1-244-714-11    | 51 k                   |
| R502            | 1-244-710-11    | 36 k                   |
| R503            | 1-244-663-11    | 390                    |
| R504            | 1-244-663-11    | 390                    |
| R505            | 1-244-673-11    | 1 k                    |
| R506            | 1-244-708-11    | 30 k                   |
| R521            | 1-244-697-11    | 10 k                   |
| R522            | 1-244-916-11    | 62 k 1/2 W             |
|                 | 1-244-917-11    | 68 k 1/2 W             |
|                 | 1-244-918-11    | 75 k 1/2 W             |
|                 | 1-244-919-11    | 82 k 1/2 W             |
|                 | 1-244-920-11    | 91 k 1/2 W             |
|                 | 1-244-921-11    | 100 k 1/2 W            |
| R523            | 1-244-643-11    | 56                     |
| R524            | 1-244-677-11    | 1.5 k                  |
| R525            | 1-206-032-11    | 5.6 k 2 W, metal oxide |
| R526            | 1-244-736-11    | 430 k                  |
| R527            |                 | -----                  |
| R528            |                 | -----                  |
| R529            | 1-244-631-11    | 18                     |
| R530            | 1-244-699-11    | 12 k                   |
| R531            | 1-244-691-11    | 5.6 k                  |
| R532            | 1-244-690-11    | 5.1 k                  |
| R533            | 1-244-636-11    | 30                     |
| R551            | 1-244-708-11    | 30 k                   |
| R552            | 1-244-690-11    | 5.1 k                  |
| R553            | 1-244-624-11    | 9.1                    |
| R554            | 1-244-647-11    | 82                     |
| R555            | 1-244-657-11    | 220                    |
| R556            | 1-244-618-11    | 5.1                    |
| R557            | 1-244-655-11    | 180                    |
| R558            | 1-207-721-11    | 3.3 2 W, wire wound    |
| R559            | 1-207-722-11    | 3.6 2 W, wire wound    |
| R560            | 1-244-651-11    | 120                    |
| R561            | 1-244-673-11    | 1 k                    |
| R601            | 1-244-642-11    | 51                     |
| R602            |                 | -----                  |
| R603            | 1-244-697-11    | 10 k                   |
| R604            | 1-244-737-11    | 470 k                  |
| R605            | 1-244-673-11    | 1 k                    |
| R606            | 1-244-684-11    | 3 k                    |
| R607            | 1-244-701-11    | 15 k                   |
| R608            | 1-244-712-11    | 43 k                   |
| R609            | 1-244-656-11    | 200                    |
| R610            | 1-244-682-11    | 2.4 k                  |
| R611            | 1-244-680-11    | 2 k                    |
| R612            | 1-244-697-11    | 10 k                   |
| R613            | 1-244-682-11    | 2.4 k                  |
| R614            | 1-206-011-11    | 6.8 k 2 W, metal oxide |
| R615            | 1-244-675-11    | 1.2 k                  |

| <u>Ref. No.</u> | <u>Part No.</u> | <u>Description</u> |
|-----------------|-----------------|--------------------|
| R616            | 1-244-680-11    | 2 k                |
|                 | 1-244-682-11    | 2.4 k              |
|                 | 1-244-683-11    | 2.7 k              |
|                 | 1-244-684-11    | 3 k                |
|                 | 1-244-685-11    | 3.3 k              |
|                 | 1-244-686-11    | 3.6 k              |
|                 | 1-244-687-11    | 3.9 k              |
|                 | 1-244-688-11    | 4.3 k              |
|                 | 1-244-689-11    | 4.7 k              |
|                 | 1-244-690-11    | 5.1 k              |
|                 | 1-244-691-11    | 5.6 k              |
|                 | 1-244-692-11    | 6.2 k              |
| R617            | 1-244-693-11    | 6.8 k              |
|                 | 1-244-694-11    | 7.5 k              |
|                 | 1-244-695-11    | 8.2 k              |
|                 | 1-244-697-11    | 10 k               |
|                 | 1-244-680-11    | 2 k                |
|                 | 1-244-682-11    | 2.4 k              |
|                 | 1-244-683-11    | 2.7 k              |
|                 | 1-244-684-11    | 3 k                |
|                 | 1-244-685-11    | 3.3 k              |
|                 | 1-244-686-11    | 3.6 k              |
|                 | 1-244-687-11    | 3.9 k              |
|                 | 1-244-688-11    | 4.3 k              |
| R618            | 1-244-689-11    | 4.7 k              |
|                 | 1-244-690-11    | 5.1 k              |
|                 | 1-244-691-11    | 5.6 k              |
|                 | 1-244-692-11    | 6.2 k              |
|                 | 1-244-693-11    | 6.8 k              |
|                 | 1-244-694-11    | 7.5 k              |
|                 | 1-244-695-11    | 8.2 k              |
|                 | 1-244-666-11    | 510                |
|                 | 1-244-697-11    | 10 k               |
|                 | 1-244-655-11    | 180                |
|                 | 1-244-660-11    | 300                |
|                 | 1-244-688-11    | 4.3 k              |
| R711            | 1-244-677-11    | 1.5 k              |
|                 | 1-244-625-11    | 10                 |
|                 | 1-244-688-11    | 4.3 k              |
|                 | 1-244-690-11    | 5.1 k              |
|                 | 1-244-703-11    | 18 k               |
|                 | 1-244-680-11    | 2 k                |
|                 | 1-244-680-11    | 2 k                |
|                 | 1-244-688-11    | 4.3 k              |
|                 | 1-244-656-11    | 200                |
|                 | 1-244-661-11    | 330                |
|                 | 1-244-665-11    | 470                |
|                 | 1-244-668-11    | 620                |
| R710            | 1-244-670-11    | 750                |
|                 | 1-244-671-11    | 820                |
|                 | 1-244-672-11    | 910                |
|                 | 1-244-673-11    | 1 k                |
|                 | 1-244-674-11    | 1.1 k              |
|                 |                 |                    |

| <u>Ref No.</u>    | <u>Part No.</u> | <u>Description</u>           |
|-------------------|-----------------|------------------------------|
| R711              | 1-244-675-11    | 1.2 k                        |
|                   | 1-244-676-11    | 1.3 k                        |
|                   | 1-244-677-11    | 1.5 k                        |
|                   | 1-244-678-11    | 1.6 k                        |
|                   | 1-244-679-11    | 1.8 k                        |
| R712              | 1-244-665-11    | 470                          |
| R713              | 1-207-469-11    | 3.3      ½ W      wire wound |
| R714              | 1-244-662-11    | 360                          |
| R801              | 1-244-688-11    | 4.3 k                        |
| R802              | 1-244-673-11    | 1 k                          |
| R803              | 1-244-666-11    | 510                          |
| R804              | 1-244-666-11    | 510                          |
| R805              | 1-244-660-11    | 300                          |
| R806              | 1-244-691-11    | 5.6 k                        |
| R807              | 1-244-642-11    | 51                           |
| R808              | 1-207-473-11    | 6.8      ½ W      wire wound |
| R809              | 1-207-467-11    | 2.2      ½ W      wire wound |
| R901              | 1-207-677-11    | 8.2      5 W      wire wound |
| R902              | 1-244-649-11    | 100                          |
| VR301             | 1-222-516-00    | 470-B, adjustable; AGC       |
| VR521             | 1-222-182-00    | 25 k-B, variable; BRIGHT     |
| VR522             | 1-222-181-00    | 1 k-E, variable, CONTR       |
| VR551 }<br>S901 } | 1-222-271-00    | 5 k-D, variable; PULL ON/VOL |
| VR601             | 1-222-719-00    | 1 k-B, variable; HOR         |
| VR701             | 1-222-799-00    | 2 k-B, variable; VER         |
| VR702             | 1-222-811-00    | 5 k-B, adjustable; V LIN     |
| VR703             | 1-222-811-00    | 5 k-B, adjustable; HEIGHT    |
| VR901             | 1-222-517-00    | 1 k-B, adjustable, 12 V adj  |

Ref. No.    Part No.    Description

**MISCELLANEOUS**

|                  |              |   |
|------------------|--------------|---|
|                  | 1-231-089-00 | filter block, AM SIF                    |
| DY               | 1-451-087-00 | deflection yoke                         |
|                  | 1-501-122-11 | telescopic antenna ass'y, including     |
|                  | 1-501-101-21 | telescopic antenna                      |
| SP               | 1-502-209-00 | speaker                                 |
| J551             | 1-507-174-23 | jack, earphone ; REC                    |
| J552             | 1-507-174-23 | jack, earphone ; EARPHONE               |
| S902             | 1-509-344-00 | socket, voltage selector                |
| S905             | 1-514-330-00 | switch, charging                        |
| S1               | 1-514-429-00 | switch, antenna selector                |
| SW1 ~            |              |   |
| SW13             | 1-516-095-00 | switch, push-button                     |
| S906             | 1-516-096-00 | microswitch, dc power                   |
| S903 )<br>S904 ) | 1-516-097-00 | switch, ac-dc selector                  |
|                  | 1-516-098-00 | switch, rotary                          |
|                  | 1-526-096-41 | socket ass'y, picture tube              |
|                  | 1-531-028-21 | selenium rectifier, high voltage (D804) |
| F903             | 1-532-204-00 | fuse, 2A                                |
| F902             | 1-532-273-00 | fuse, 250 m AT                          |
| F901             | 1-532-279-00 | fuse, 500 m AT                          |
|                  | 1-533-096-12 | holder, fuse                            |
|                  | 1-534-511-25 | IF output cable                         |
|                  | 1-534-587-00 | cord, power supply                      |
|                  | 1-536-179-00 | terminal strip                          |
|                  | 8-731-911-10 | picture tube, CT-507S                   |

\* : to be selected

B&amp;W TV

TV-112UM

No. 2  
January, 1974

# SUPPLEMENT

**Subject: Electrical and Mechanical Modifications**

This supplement updates the service manual to include production changes starting with **Serial No. 29,101**.  
File this supplement with the service manual.

## 1. INTRODUCTION

Some electrical and mechanical parts have been changed along with UHF tuner (BT-186).

## 2. CHANGED PARTS LIST (Serial No. 29,101 and later)

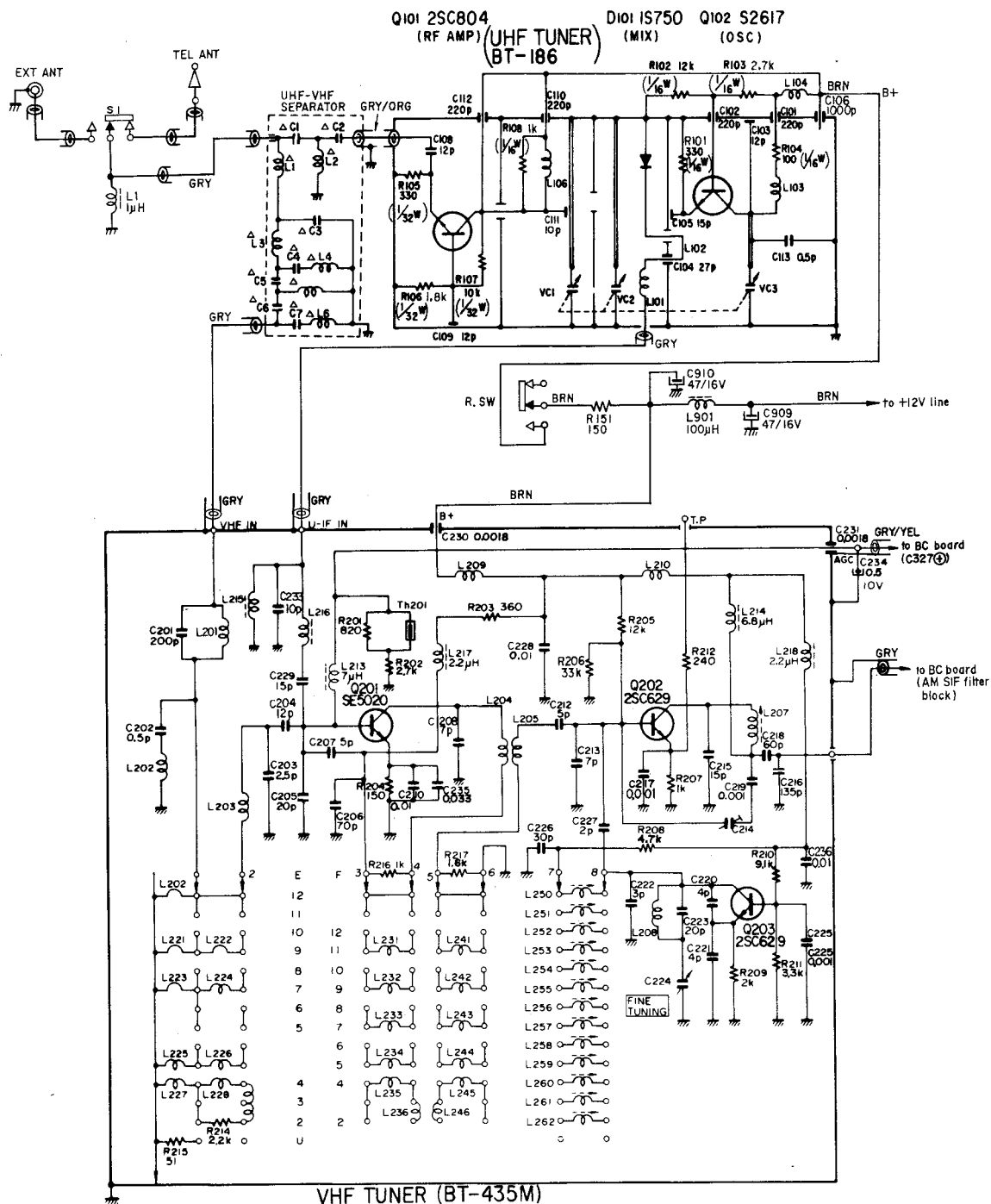
| Ref. No. | Former Part No./Part Value                                    | New Part No./Part Value                                       |
|----------|---|---|
|          | 1-463-108-00<br>UHF tuner (BT-188)                            | 1-463-004-00<br>UHF tuner (BT-186)                            |
| T1       | 1-417-014-21<br>Transformer, antenna matching; UHF            | -----   |
| T2       | 1-417-014-51<br>Transformer, antenna matching; VHF            | -----   |
| R151     | 1-244-660-11 300 $\Omega$ $\frac{1}{4}$ W<br>$\pm 5\%$ carbon | 1-244-653-11 150 $\Omega$ $\frac{1}{4}$ W<br>$\pm 5\%$ carbon |
|          | -----   | 1-417-020-61<br>UHF-VHF separator (DFE-1)                     |
|          | -----   | 1-508-086-00<br>Connector, external antenna                   |

**SONY**  
**SERVICE MANUAL**

## 3. SCHEMATIC DIAGRAM

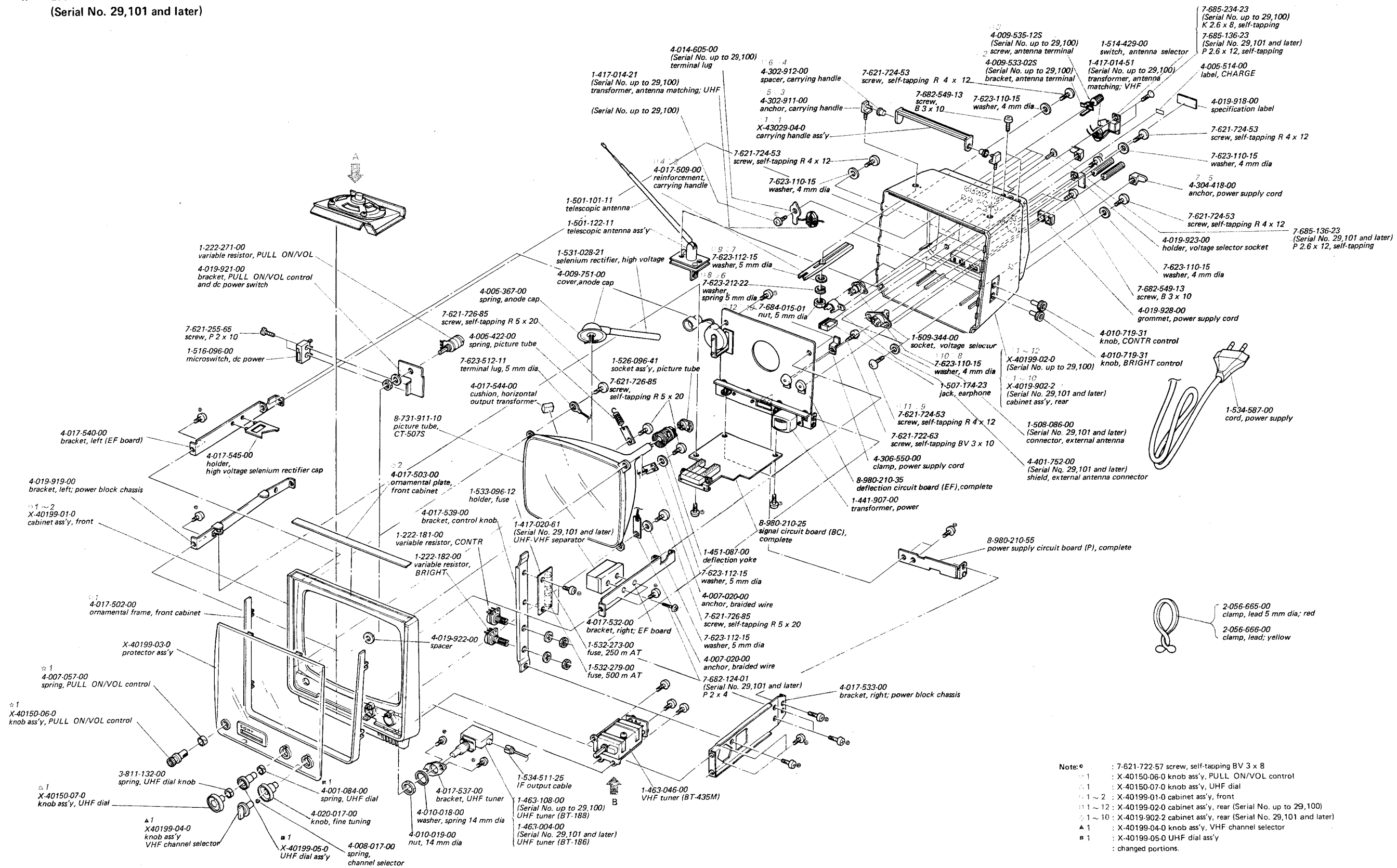
(Serial No. 29,101 and later)

— UHF-VHF Separator (DFE-1) and UHF Tuner (BT-186) —

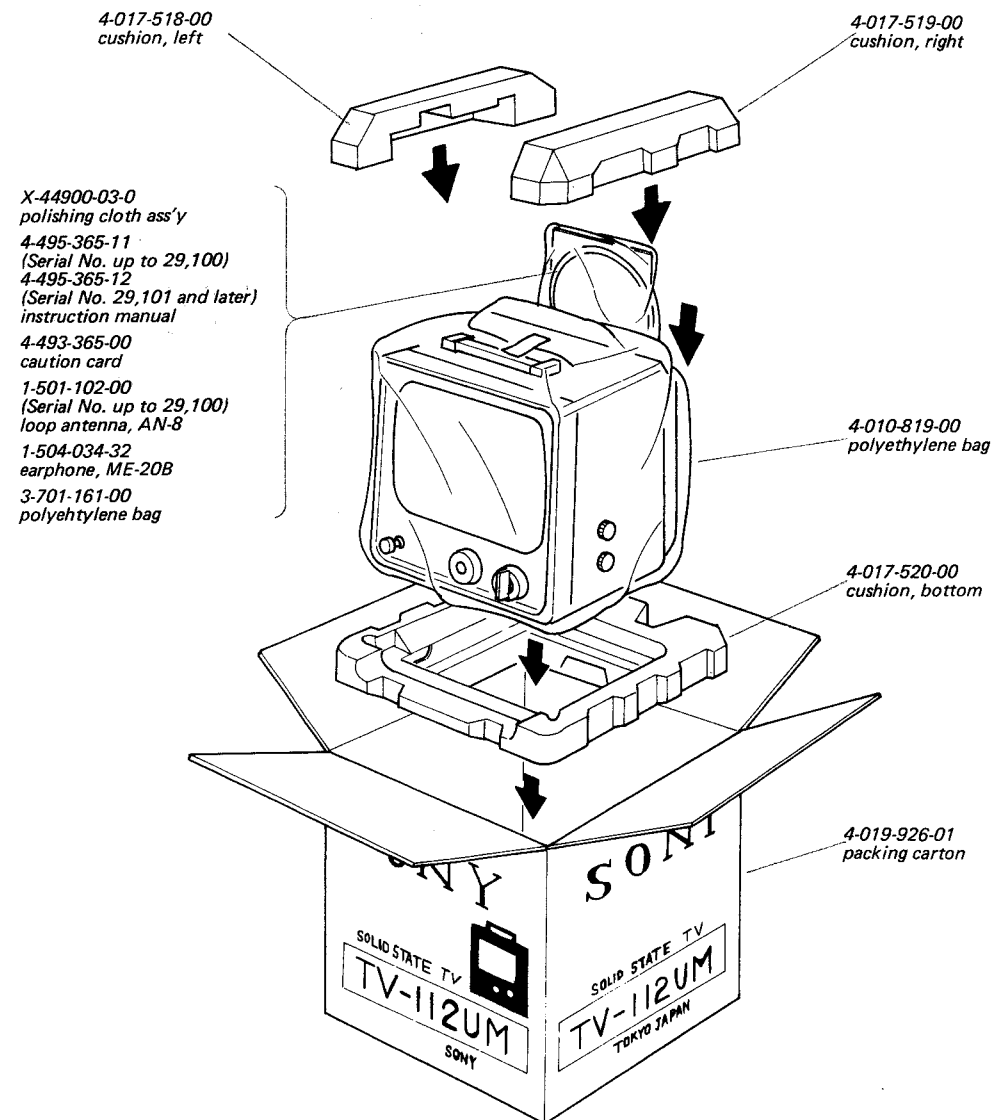


Note: : changed portions.

(Serial No. 29,101 and later)



5. PACKING  
(Serial No. 29,101 and later)



Note: . . . changed portions.

9-962-113-82

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## SUPPLEMENT

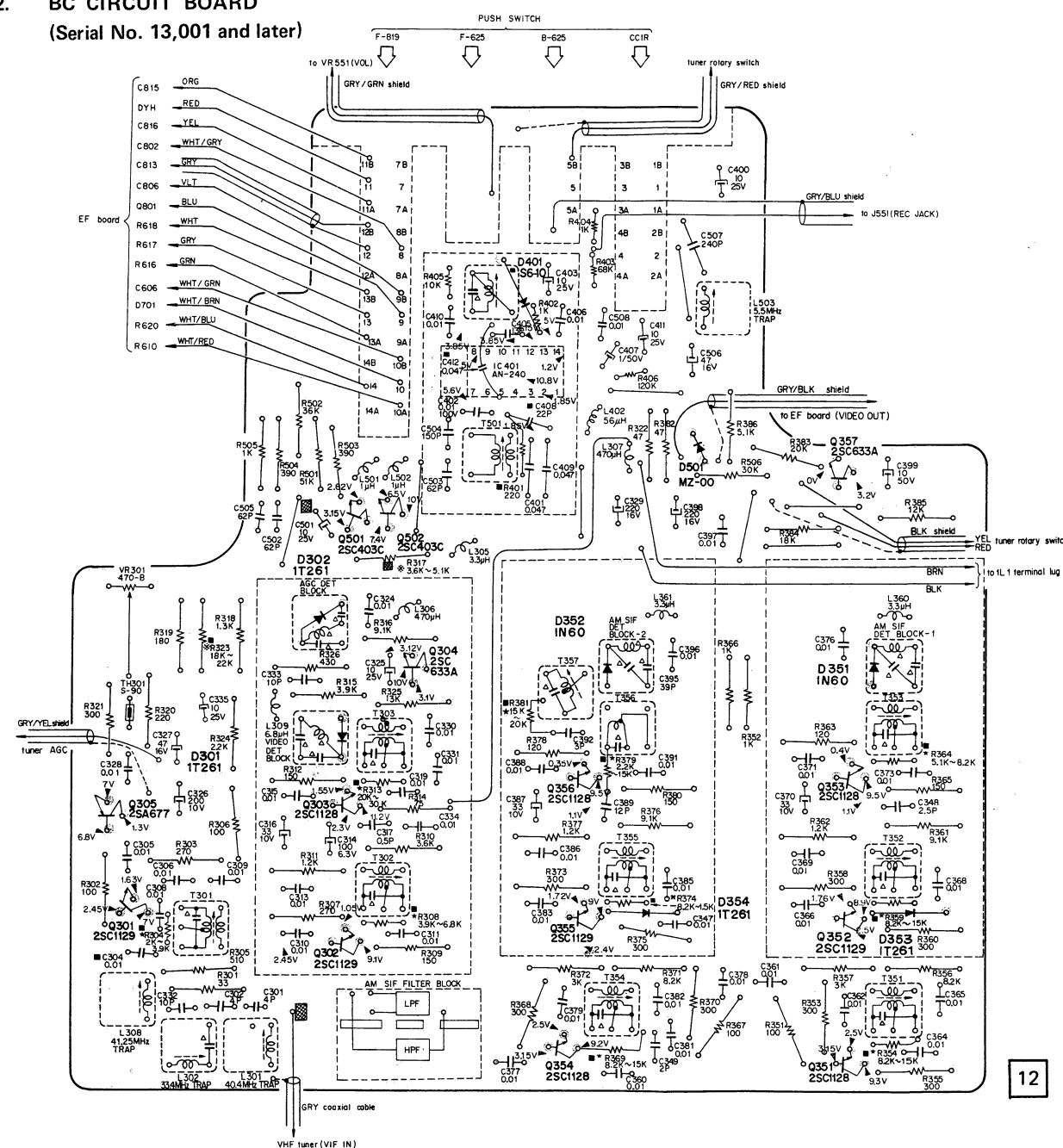
No. 1  
July, 1972

This supplement updates the service manual to include production change starting with serial number **13,001**. File this supplement with the service manual.

**Subject:** Production change of EF and BC circuit boards.

## 1. DETAILS OF CHANGED PORTIONS

| Mark on Diagram | Ref. No.           | Former               | New                   | Description  |
|-----------------|--------------------|----------------------|-----------------------|--|
|                 | C348               | 2 p                  | 2.5 p                 |  |
|                 | C400               |                      | 10/25 V               | added  |
|                 | C407               | 10/25 V              | 1/50 V                |  |
|                 | C412               |                      | 0.0047                | added  |
|                 | C610               |                      | 100 p/500 V           | added  |
|                 | C811               | 0.0068/600 V         | 0.0068/1000 V         |  |
|                 | C812               | 0.001 ~ 0.0047/600 V | 0.001 ~ 0.0047/1000 V |  |
|                 | C813               | 0.001 ~ 0.0033/600 V | 0.001 ~ 0.0033/1000 V |  |
|                 | R617               | 10 k                 | 5.6 k                 |  |
|                 | R621               | 180                  | 270                   |  |
|                 | C411               | 10/25 V              | 10/25 V               | Mounting position is changed.                                  |
|                 | R406               | 120 k                | 120 k                 | Mounting position is changed.                                  |
|                 | R533               | 30                   | 30                    | Mounting position is changed from chassis to EF circuit board. |
|                 | Push-button switch |                      | KSW14                 | Terminal (KSW14) is newly used.                                |

2. BC CIRCUIT BOARD  
(Serial No. 13,001 and later)

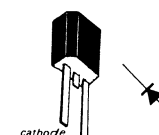
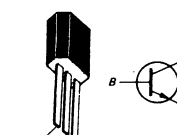
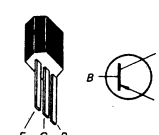
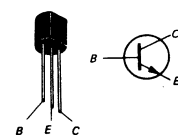
2SC1128, 2SC1129

2SA677

2SC633A, 2SC403C

1T261, IN60, S6-10

MZ-00

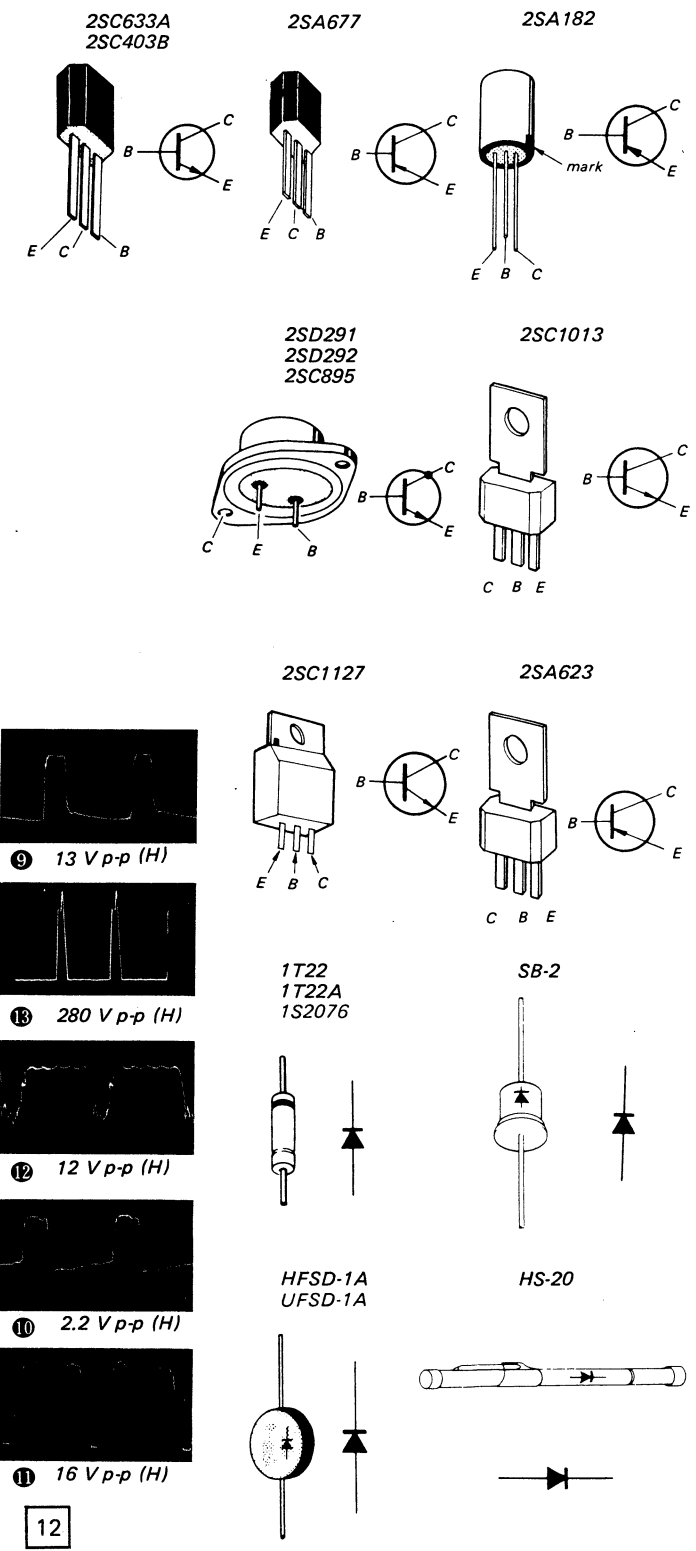
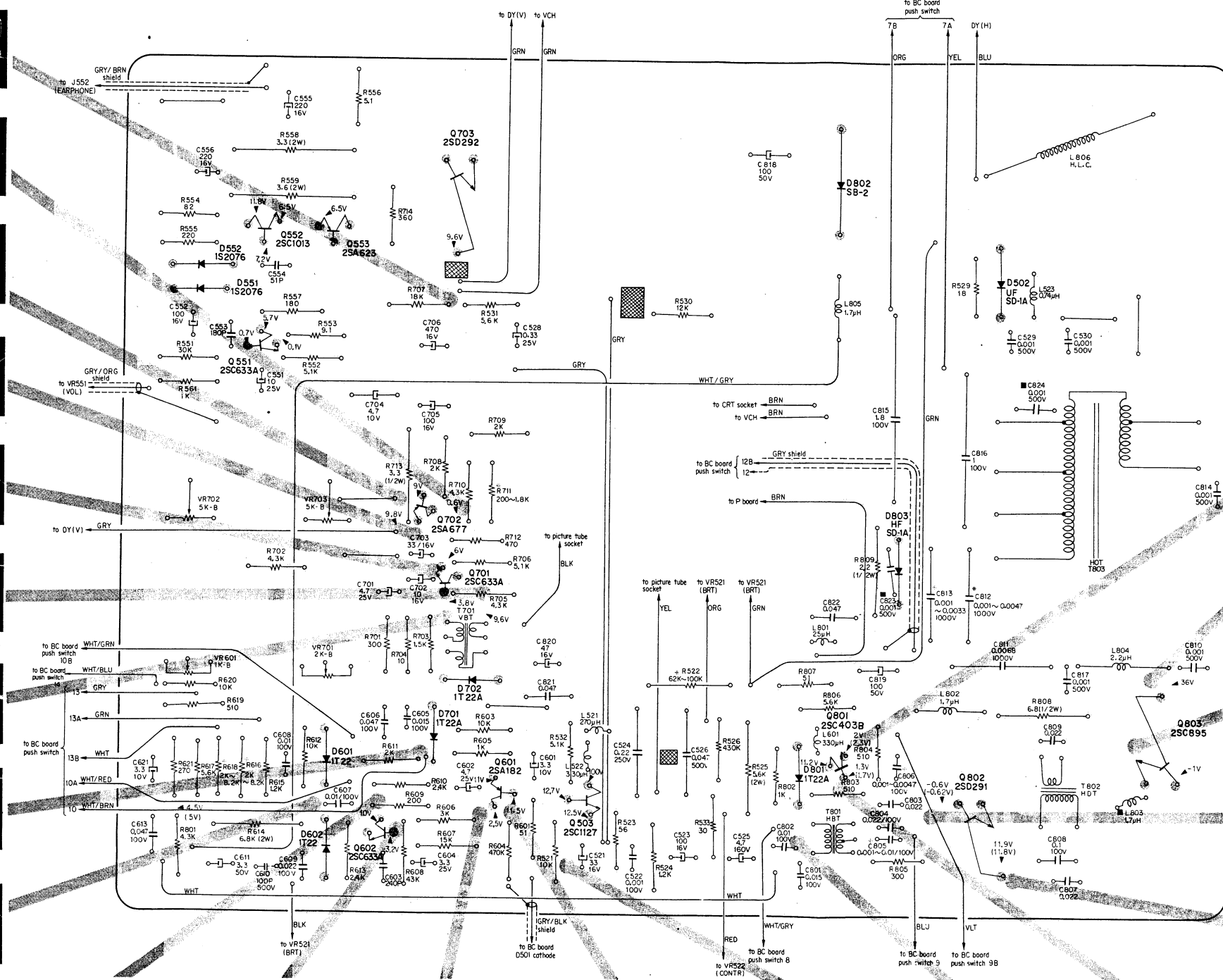
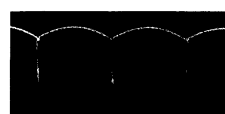
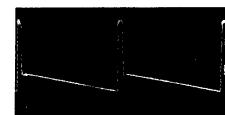


**Note:** 1. The components marked with ■ are mounted on the conductor side.

2. As for the resistors marked ★ replace the same value when it is necessary.

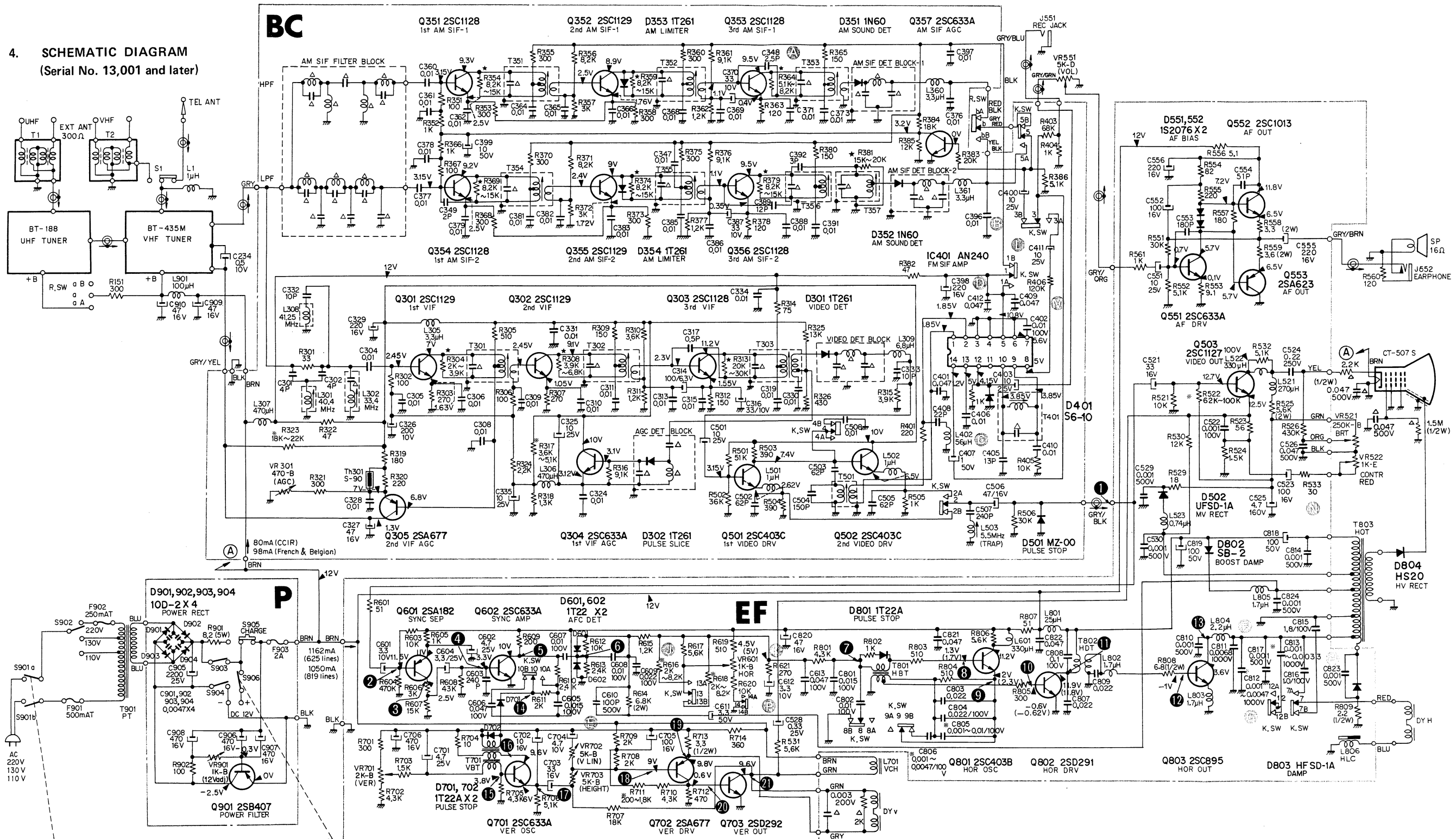


### 3. EF CIRCUIT BOARD (Serial No. 13,001 and later)



**Note:** The components marked with ■ are mounted on the conductor side.

4. SCHEMATIC DIAGRAM  
(Serial No. 13,001 and later)



Note: 1. All capacitors are 50 WV unless otherwise specified.  
2. All capacitance values are in  $\mu F$  except as indicated with p, which means  $\mu F$ .  
3. All resistors are  $\frac{1}{4}$  W unless otherwise specified.  
4. All resistance values are in ohms. k = 1000.

5. Voltages measured from chassis to point indicated with a VOM (DC 20 k ohms/V) with no signal input (BC circuit and audio stages in EF circuit), and with signal input (EF circuit). The values shown in ( ) are measured with push switch set to 819.  
6. Resistance and capacitance values marked  $\pm$  are to be selected to yield specified operating conditions.

7. The red circled numbers (1 ~ 21) indicate the waveforms on pages 3 and 4.  
8. Push-button switch (KSW 1 to KSW 14).  
A ; on (push) position  
B ; off position  
KSW 1 ~ 4 ; CCIR  
KSW 5 ; 625B  
KSW 7 ~ 14 ; 819F

9. Rotary switch (RSW a, RSW b)  
RSW a ; UHF  
aB ; VHF  
RSW b ; F2, 4, 5, 8, 10, 12 ch.  
bB ; F6, 7, 9, 11, U ch.  
10. As for the resistors marked  $\star$ , replace the same value when it is necessary.  
11.  $\Delta$  mark shows the internal components.

5. NEW ELECTRICAL PARTS LIST  
(Serial No. 13,001 and later)

| <u>Ref. No.</u>  | <u>Part No.</u> | <u>Description</u>                     | <u>Ref. No.</u>   | <u>Part No.</u> | <u>Description</u>                     |
|--|-----------------|--|---|-----------------|--|
| CAPACITORS   |                 |  |   |                 |  |
| Capacitors are in $\mu F$ except as indicated with p, $\pm 100\%$ , 50 WV and ceramic unless otherwise specified. P means $\mu\mu F$ |                 |  |   |                 |  |
| C348   | 1-101-574-11    | 2.5 p $\pm 0.25$ p                     | *C813   | 1-129-900-11    | 0.001 $\pm 10\%$ 1000 WV polyethylene  |
| C400   | 1-121-398-11    | 10 $\pm 10\%$ 25 WV electrolytic       |   | 1-129-910-11    | 0.0015 $\pm 10\%$ 1000 WV polyethylene |
| C407   | 1-121-391-11    | 1 $\pm 75\%$ 50 WV electrolytic        |   | 1-129-901-11    | 0.0022 $\pm 10\%$ 1000 WV polyethylene |
| C412   | 1-101-006-11    | 0.0047                                 |   | 1-129-902-11    | 0.0033 $\pm 10\%$ 1000 WV polyethylene |
| C610   | 1-101-810-11    | 100 p $\pm 5\%$ 500 WV                 | RESISTORS   |                 |  |
| C811   | 1-129-904-11    | 0.0068 $\pm 10\%$ 1000 WV polyethylene | All resistors are in ohm, carbon, $\pm 5\%$ and $\frac{1}{4}$ W unless otherwise specified. |                 |  |
| *C812  | 1-129-900-11    | 0.001 $\pm 10\%$ 1000 WV polyethylene  | R403  | 1-242-717-11    | 68 k                                   |
|  | 1-129-910-11    | 0.0015 $\pm 10\%$ 1000 WV polyethylene | R404  | 1-242-673-11    | 1 k                                    |
|  | 1-129-901-11    | 0.0022 $\pm 10\%$ 1000 WV polyethylene | R617  | 1-244-691-11    | 5.6 k                                  |
|  | 1-129-902-11    | 0.0033 $\pm 10\%$ 1000 WV polyethylene | R621  | 1-244-659-11    | 270                                    |
|  | 1-129-903-11    | 0.0047 $\pm 10\%$ 1000 WV polyethylene |   |                 |  |

\* to be selected